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Northern Pacific Railroad;

ITS

ROUTE, RESOURCES, PROGRESS AND BUSINESS

THE NEW NORTHWEST
AND ITS GREAT THOROUGHFARE.

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JAY COOKE & CO.

FINANCIAL AGENTS OF THE NORTHERN PACIFIC RAILROAD CO.

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ECONOMICS

THE NEW NORTHWEST.

LAND GRANT

OF

THE NORTHERN PACIFIC RAILROAD COMPANY.

THE charter granted by the Congress of the United States of America to the Northern Pacific Railroad Company, with its amendments, confers the right to construct a line of Railroad and Telegraph across the continent, between some point on Lake Superior, in the State of Wisconsin or Minnesota, and some point on Puget Sound, *via* the valley of the Columbia river, by the most eligible route within the territory of the United States, on a line north of the 45th parallel of latitude, with a branch to Puget Sound across the Cascade mountains from some convenient point on the main trunk line.

The charter grants the Company for each mile of track 20 alternate sections of public land (640 acres to the section) on each side of the line of the Road in the Territories, and 10 alternate sections on each side of the line in the States, through which it runs. This is equivalent to 25,600 acres per mile through the Territories, and 12,800 acres per mile through the States, or an average of nearly 23,000 acres per mile along the entire length of the Road. The grant is the same for the chartered branch of the Road as for the trunk line. It grants to the Company the right of way for their Road and Telegraph line through the public domain, to the extent of 200 feet in width on each side of the track, and all necessary ground for station-buildings, workshops, depots, machine-shops, switches, side-tracks, turn-tables, and water-stations. It grants to the Company the right to take from the public domain adjacent to the line of the Road, earth, stone, and timber for construction. If, owing to pre-emption, settlement under the Homestead Law, or other cause, the Company cannot get, within the above limits, the quantity of land per mile to which it is entitled by its charter, it may make up the deficiency anywhere within twenty miles beyond either boundary of its land grant. This provision renders it absolutely certain that the Company will receive the full amount of land granted.

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The amount of land granted to the Northern Pacific Railroad by its charter, original and as amended, exceeds Fifty Millions (50,000,000) of acres. This superb estate is larger by 10,000 square miles than the six New England States, or as large as Ohio and Indiana combined. There is room in it for ten States as large as Massachusetts, each of them with a soil, a climate, and resources of coal, timber, ores of metals, and perpetual water-power, altogether superior to those upon which Massachusetts has become populous, rich, refined, and politically powerful. The grant is nearly seven times as large as Belgium, or more than three and a half times as large as Holland.

CLIMATE—TEMPERATURE, MOISTURE, SOIL.

Three conditions are essential to successful agriculture and the sustenance of a dense population, viz. :—1. A climate warm enough to ripen crops, and secure the comfort of man and beast. 2. A soil of reasonable natural fertility. 3. Sufficient moisture to render that soil productive. Either of these elements being absent, the result is a more or less sterile country. Upon the fact that these three prime conditions are found combined in the region traversed by the Northern Pacific Railroad rest the need, the feasibility and the assured success of this great enterprise.

Temperature.—The belt of country tributary to the Northern Pacific Road is within the parallels of latitude which in Europe, Asia, and America, embrace the most enlightened, creative, conquering and progressive populations. It is within the climatic conditions illustrated on the maps by the curvature Northwards of the isothermal lines of mean temperature which mark on the Pacific coast in latitude 47 North, the mildness of the climate of the Chesapeake Bay on the Atlantic side in latitude 38, and which give to the region of this railroad between the Great Lakes and the Pacific a milder atmosphere than is to be found anywhere else at the same distance north of the equator, except upon the Western coast of Europe. The summer isothermal line of 70 degrees, which in Europe passes through Southern France, Lombardy, and the wheat-growing region of Southern Russia, strikes the Atlantic coast of the United States at the east end of Long Island, and passing through Central Pennsylvania, Northern Ohio and Indiana, diverges northwesterly, and runs up into the British Possessions to latitude 52, at least 360 miles north of the line of this Road.

The fact of this mildness of climate is abundantly established. Nowhere between the Lakes and the Pacific is the climate colder than in Minnesota; and this great State is not surpassed as a grain-growing region, or in healthfulness of atmosphere. The seasons of Dakota are very similar to those of Iowa, and from Dakota westward the climate steadily modifies, until, in Oregon and Washington Territory, there is almost no winter at all aside from a rainy season, as in California. In many portions of Dakota, Montana, and Northern Idaho, cattle and horses range out all winter, and keep in excellent condition on the nutritious grasses of the plains and valleys. Records kept by Government officers at the various military stations on the upper waters of the Missouri, show that the average annual temperature for a series of years has been warmer in Northern Montana than at Chicago or Albany.

This remarkable modification of climate, the existence of which no well-informed person now questions, is due to several natural causes, chief among which are probably these:—First, the mountain country lying between the 44th and 50th parallels is lower by some 3,000 feet than the belt lying immediately south. The highest point on the line of the Northern Pacific Road is 3,300 feet lower than the corresponding summit of the Union and Central line. Both the Rocky and the Cascade ranges, where they are crossed by the Northern Pacific route, are broken down to low elevations compared with their height four hundred miles southward. This difference in altitude would itself account for much of the difference in climate, as three degrees of temperature are allowed for each thousand feet of elevation. But, second, the warm winds from the South Pacific, which prevail in winter, and (aided by the warm ocean current corresponding to our Atlantic gulf-stream) produce the genial climate of our Pacific coast, pass over the low mountain ridges to the north of latitude 44°, and carry their softening effect far inland, giving to Washington Territory the climate of Virginia, and to Montana the mildness of Southern Ohio.

Professor Blodget, in his standard work, the *Climatology of the United States*, says of the Northwest:—

> The assertion may appear at first unwarranted, but it is demonstrable that an area not inferior in size to the whole of the United States east of the Mississippi, lies west of the 98th meridian, and above the 43d parallel, which is *perfectly adapted to the fullest occupation by cultivated nations.* It has an immense and yet unmeasured capacity for occupation and expansion.

Hon. E. D. Mansfield, Commissioner of Statistics for Ohio, whose life-long study of the questions of climate, settlement, migration, and agricultural industries, gives his opinions deserved weight throughout the country, says, in a recent contribution to the Cincinnati *Gazette* :—

> Neither lines of latitude nor boundary lines have much to do with climate, at least anywhere south of the 65th degree. We certainly cannot ignore the fact that England and Ireland are among the most fertile and productive countries of Europe, although entirely north of the whole of the United States. When we inquire for the true character of any unsettled region within the temperate zone, we must look to other conditions. Soil is largely influenced by geological elements. Temperature is most largely influenced by currents of wind, generally arising on the great ocean waters, modified by plains and deflected by mountains. What, then, is the character of what we may call the interior of the great Northwest?
>
> The Northern Pacific route is very near the southern boundary of the vast productive region we speak of, and therefore the theory of a too rigid climate will not, in any event, be applicable to it. But we shall here trace the climatic line of cereal production in reference to this great region generally, believing the great question of the value of lands, and of the road itself, is the *question of actual settlements.* Are they practicable and probable? If we suppose an arable country, half as fertile as that of Ohio, we shall have a country which in a few years will be settled and valuable. Let us look, then, first of all, to the isothermal lines—lines of vegetable production. If we knew nothing of Japan, we should know all about its vegetable products (other things being equal) by knowing that the isothermal lines of Ohio pass through Japan. Turning, then, to the lines of cereal production, we find (see Blodget's maps) that, proceeding from the point where the 40th degree north latitude touches the Atlantic coast, the isothermal line tending north reaches Lake Erie near Cleveland, passes through or near Chicago, crosses the Mississippi above the 45th degree, goes north of the Upper Missouri, and crossing the boundary of the United States, ascends to the 50th degree into the Valley of the Saskatchewan. Taking the isothermal line of Nantucket (Mass.), and it passes still higher. We find, then, in point of fact, that the climate of the region from the Upper Missouri to the Saskatchewan is substantially that of New York, and that it is exactly the climate which in Europe is deemed best for grain growing.

An army officer, who has spent a dozen years in Montana, writes:—“I have travelled in many countries, and been stationed in many different portions of America, but I have never found a climate that suited me so completely as this of Montana.” A resident of Northern Montana writes, that on January 9th, 1871, his family spent the day without fires, and with open windows. On the 30th of December, 1870, Judge Rice, of Maine, plucked a bouquet of flowers in the open fields in Washington Territory. Rev. Mr. Spaulding, the venerable missionary who has spent thirty years in Idaho, Montana, and Oregon, assures us that herds of domestic cattle are wintered on the slopes of the Rocky Mountains, with no food but the abundant bunch-grass.

This could not be done in Southern Illinois. Stock-raisers in Wyoming and Southern Idaho drive their herds north, to the vicinity of the Northern Pacific route, to spend the winters, on account of the milder season, less snow-fall, and abundant grazing. Buffalo make similar migrations, taught by instinct and experience. A few definite facts like these (and they could be multiplied without limit) outweigh volumes of climatic theory. The subject of the temperature of the belt within which lies the Land Grant of the Northern Pacific Railroad, cannot be better summed up than by repeating that Minnesota has the average temperature of Northern New York without its discomfort and chill; Dakota, that of Iowa, with a drier and more invigorating air; Montana, that of Ohio without its dampness and changeableness; Washington and Oregon have the climate of Virginia, with more rain and cooler summer-nights.

Moisture.—One of the causes heretofore cited as helping to produce the mild seasons of the New Northwest—namely, the depression of the mountain ranges toward the north—may also account for the equable rain-fall in nearly all parts of this vast area. The southwest winds, saturated by the evaporation of the tropics, carry the rain-clouds eastward over the continental divide, and distribute their moisture over the Fertile Belt stretching from the mountains to the lakes. Further south the mountain ridges, with their greater altitude, act as a wall against the warm, moist, west winds; hence the colder winters and the comparative dryness of much of the region south of Montana and east of the mountains. That the country tributary to the Northern Pacific Railroad, and embracing its Land Grant, has, with some exceptions, an adequate supply of atmospheric moisture for all purposes of agriculture and stock-raising, there is no question. The proof is abundant and conclusive, and is made up of the concurrent testimony of settlers who have spent years in all portions of the great Fertile Belt, and of Government officers who have measured and reported the rain-fall for successive seasons. Mr. Mansfield, in the course of the same paper from which we have quoted above, says on this point:

> But there is another element of climate which we admit to be of the highest importance, and which has proved the great point of difficulty with that great central region through which the Union Pacific passes. This is the aridity or want of rain. In the whole of that great arid plain, on the eastern side of the Rocky Mountains, there is only a breadth of fifteen miles just at the foot of the main ridge where the clouds are condensed, in which agriculture can be carried on without

irrigation. The same thing is true of that vast country on or near the 35th parallel. This is the reason why New Mexico, Colorado, and that section, have not become populous. Exactly the reverse is true of that Northwestern region of which we speak. The great currents of air which have left the central region comparatively rainless, have, on the other hand, given ample supplies of water to the great Northwest. * * * * *

And here we have to state, in behalf of this most valuable and interesting region a fact which seems almost incredible, but of the truth of which there is no doubt. It is this: that in the high latitudes, north of the Missouri river, *less snow falls in winter*, and *more rain in summer*, than in the latitudes below. Hence the Northern Pacific has, in fact, far less climatic difficulties to encounter on the line of the route than has the Union Pacific. This is an all-important fact, and while we might cite several authorities on this point, we shall cite only one, which we think conclusive. This is the memorandum on the climate of the Northern Route, prepared by Gen. George B. McClellan, and found in the "United States Explorations," Vol. 1, pages 128–130. There is no doubt of the fact, as stated by both Blodget and McClellan.

Admittedly there are portions of the vast region tributary to the Northern Pacific Railroad, where for the present the rainfall is insufficient for most crops, and irrigation is necessary, yet even in such localities the grazing is usually good the year round. The wonderful network of living brooks, lakes, streams, and navigable rivers, with which this region is supplied is perhaps its most striking feature, and furnishes the basis for a most simple and economical system of irrigation wherever that shall seem to be needed.

Soil.—Those who have traversed the whole of the Fertile Belt from the Mississippi to Puget Sound claim that there is no other section of the Continent of equal area which, all things considered, surpasses this in natural resources, including a fertile soil; and the evidence is superabundant in support of this view. That the average of soil in those portions of Minnesota, Dakota, Montana, Idaho, Washington, and Oregon adjacent to the Northern Pacific Railroad is good, there is absolutely no question. Of alkali-plains, sand, and sage-brush there is next to none at all on the route. Of Minnesota (in the richest portions of which State the Northern Pacific Railroad and its branches receive six million acres of land) Governor Marshall says:

The area of this district of Northern Minnesota and the Red River valley in Dakota, through which the Northern Pacific Railroad will run, and to which it will pour out its wealth of production, is scarcely less than 60,000 square miles, or 38,400,000 acres. Its capacity for producing the cereals may be estimated from the present production of the tilled lands of Minnesota. The reliable estimates of the Commissioner of Statistics of Minnesota give the area cultivated in 1869 at 1,100,000 acres (about 2 per cent. only of the whole area of the State), and the yield of this area the present year at over 20,000,000 bushels! Upon this basis, the Northern district I have described is capable of producing the enormous quantity of over SIX HUNDRED MILLION bushels—many times greater than the entire wheat crop of the United States, and equal to that of the whole world! The valley of the Red River alone, I believe, is capable of producing breadstuffs for the whole United States.

* * * * * * * * * *

The country west of the Red River valley across to the Missouri River is a fertile plain covered with nutritious grasses, but destitute of timber, except along the streams. The soil seems everywhere good, and the surface favorable for farming.

The U. S. Land Commissioner, Hon. Joseph S. Wilson, in his report for 1869, said:

The Northern Pacific offers a pretty safe guarantee against those formidable obstructions from snow which the more southern route has already experienced. The undeveloped resources of this Company are attracting the attention of capitalists. Its landed subsidy is double that of the Union Pacific Road. Comparatively a very small proportion of this line runs through an elevated region. Governor Stevens [who repeatedly passed over the route of the Northern Pacific Road, and studied it in all its aspects] was of the opinion that *not more than one-fifth of the land from Red River to Puget Sound is unsuited to cultivation, and that this fifth is largely made up of mountains covered with bunch grass and valuable timber and filled with the precious metals.* It is evident that an immense agricultural area is here awaiting development. The great wheat-growing regions on the left bank of the Upper Missouri promise speedy settlement upon the opening of an avenue for the transportation of their products to market. Each section of the Road as it is completed, will, from local traffic alone, find ample returns for its investment.

Quincy A. Scott, describing the Yellowstone valley, in Montana, says:

Some of the other valleys are beautiful. This is grand. It abounds in magnificent scenery, most excellent farm-sites, and water-powers. The soil is very rich and fertile, timber very convenient, coal and iron cropping out in abundance at different points, and at others evidence of rich deposits of copper, while the surrounding mountains are full of gold and silver-bearing quartz.

To quote once more the language of Hon. E. D. Mansfield:

It being shown, then, that these difficulties—winter snows and want of water—which are so formidable on the Union Pacific route, do not exist at all on the Northern, but, on the contrary, that there is light snow, abundant rains, and the isothermal (climatic) lines of England, Ireland, and Germany, we may turn for a moment to the general character of the soil. [Here Mr. Mansfield quotes various authorities.]

> Thus the testimony of the most intelligent and scientific observers agree (and we might cite many more) that in this great region—on the south side of which the Northern Pacific will pass—there is soil, climate, moderate seasons, and abundant water, equal to those fertile and productive sections of the temperate zone in Middle and Northern Europe, which have there brought population, wealth, and arts.

In 1805, Lord Selkirk began colonization in British America, on the northern side of this Northwestern Fertile Belt, and claimed for this tract a capacity to support thirty millions of people. This would only be sixty persons to the square mile, and this is less than in countries far inferior.

Blodget, in his *Climatalogy*, says of this fertile region beyond the British border, which will soon be furnishing traffic to this Road:

> All the grains of the cool, temperate climate are produced abundantly. Indian corn may be grown on both branches of the Saskatchewan [500 miles north of the Northern Pacific Railroad Land Grant], and the grass of the plains is singularly abundant and rich. Not only in the earliest period of exploration of these, but now, they are the great resort for buffalo herds, which, with the domestic herds, and the horses of the Indians and the colonists, remain on them and at their woodland borders through the year.

Governor Potts, of Montana, states that at an agricultural fair in that territory, in 1870, he saw various samples of wheat, which yielded 80 bushels to the acre. Forty bushels to the acre is not an unusual crop in the Yellowstone valley. If the average yield is thirty bushels it is double that of Ohio. The record of the production of wheat in the Columbia valley shows that its soil is equal to that of the Yellowstone. The Walla Walla land is as good as that of the Columbia—forty bushels of wheat to the acre, weighing sixty-three pounds to the bushel, roses and other flowers blooming in the open air on Christmas Day, and fruit for market in two years after transplanting of the grafts, being the proof. The valleys of the Pelouse, Snake, Spokane, Bitter-root, Jocko, Flathead, and Deer Lodge, are very fertile. The settlers in the Gallatin, Madison, and Jefferson valleys claim to have the best of soil and climate. That the climate of that New Northwest, which is now opening to settlement, travel, and trade, is such as to make a congenial home for the migrating millions of central and northern Europe, and the crowded portions of our own land, there is no doubt. That its soil, its resources of minerals and timber, its matchless water-courses, and its accessibility to the commerce and the markets of the world, also adapt it to be the residence of a numerous and thrifty population, is equally unquestionable.

TIMBER AND MINERALS.

Unlike the lands of any and all other routes of trans-continental railway, the Land Grant of the Northern Pacific Railroad has ample supplies of timber for the construction and maintenance of its line, and for the supply of its present and future population; and this is so situated that it may be transported from either terminus over the road as fast as constructed, and at the same time distributed east and west from the Rocky Mountain centre. In Minnesota the Road traverses a hundred miles of forest. Thence westward the streams and lakes are usually fringed with timber. The materials for an unlimited lumber trade exist on and near the western end of this Land Grant, and maintain with a single interruption to the eastern foot of the Rocky Mountains. Forests of fir of three varieties, of cedar of two varieties, of pine, spruce, hemlock, cypress, ash, curled maple, and black and white oak, envelope Puget Sound, and cover the larger part of Washington Territory, surpassing the woods of all other countries in the size, quality, and quantity of the timber. The firs in many localities will cut 120,000 feet to the acre. Trees are common whose circumferences range from 20 to 40 feet, and whose heights vary from 200 to upwards of 300 feet. The paradox of firs too large to be profitably cut into lumber is to be seen in various parts of Western Washington. The cedars of Washington are as thick through as the firs, but not so tall. Forests yielding 100,000 feet and upwards per acre are common around Puget Sound. The wood of the firs and cedars, unequalled for lightness, straightness of cleavage, and resistance of moisture, stronger than oak, and more retentive of spikes and tree-nails, will supplant all other timber for ship-building on both shores of the Pacific Ocean. In 1869 Puget Sound exported above 180 million feet of lumber, 20 millions of lath and shingles, and a large amount of masts, spars, and piles. The product of the as yet scarcely scarred forests of Washington Territory was sold in California, South America, Australia, Japan, China, the East Indies, and Europe. The Land Grant of the Northern Pacific Railroad covers several million acres of these magnificent fir forests, which are not only the wonder of travelers, but, what is more to the point, they constitute an element of vast wealth to the Company, and hence of security to its creditors.

Coal.—This Land Grant has an abundance of fuel in addition to its timber. Bituminous coal of a good quality outcrops for 100 miles on the eastern rim of Puget Sound. Three veins have been opened which can be cheaply worked, the lowest being 16 feet thick. West of the Cascade range of mountains coal is found and mined at different points all the way from Willamette Valley to Bellingham Bay. The San Francisco ocean steamers are supplied from the Puget Sound mines. In 1870, twenty-five thousand tons of Coal were shipped to San Francisco from a single mine on Puget Sound. Coal has been found near the Cowlitz and Snoqualmie Pass of the Cascades. It outcrops on the Yellowstone and the head waters of the Missouri. It is extensively mined for government and public use at the great bend of the Missouri. It is certainly known to underlie much of the area from the Rocky Mountains to the Mississippi on the line of the Northern Pacific Railroad. In Minnesota it has been discovered on a tributary of the river of that name, and on the Sauk. In Dakota it outcrops on the banks of the Cheyenne. It abounds in British America.

Other Minerals.—At the eastern end of the Grant, and near the line of the Road, are the well-known Lake Superior mines of copper, and of the famous magnetic iron ore. Deposits of iron have been discovered within two or three miles of where the Northern Pacific route crosses the Cascade range. At an early day it is the intention of the Railroad Company to furnish itself with rails from the abundant supplies of iron ore distributed at various points along its line. From the eastern foot-hills of the Rocky Mountains to Puget Sound this Land Grant belts as rich mineral deposits as are to be found on the continent, consisting of gold, silver, platinum, lead, copper, iron, and rock salt. The gold yield of this region was Twenty Million dollars in 1870, and the evidences increase of the richness and permanent character of these mines. Although the precious metals are reserved from the grant, their presence within its limits, in practically inexhaustible quantities, adds very greatly to the value of adjacent railroad lands. The iron and coal lands, which are the property of the Railroad Company, will prove one of its most fruitful sources of wealth.

COMPARED WITH OTHER GRANTS.

A second measure of the value of this Land Grant may be taken from the sales of the lands granted by Congress to the Illinois Central Railroad, to the Kansas Pacific Railroad, and the sales of the Minnesota School Lands.

The Illinois Central received a Land Grant of 2,595,000 acres, mainly treeless prairie. Sales from this grant up to January 1, 1869, had amounted to $23,793,255, including interest on deferred payments, and there remained unsold 526,690 acres, worth $10 per acre. In other words, the Illinois Central's grant of 2,595,000 acres, when all sold, will have yielded the Company fully $30,000,000—an average of more than $11 per acre, and more than the total cost of building the Road. So safe were the credit sales of these lands that, at the close of the year 1867, upwards of 15,000 individual accounts were on the Illinois Central Company's books, and not a suit or a claim was pending in court in relation to any one of them.

Financiers and dealers in public and corporate funds may better appreciate the value of the Illinois Central Grant from the fact that in 1868 the Company paid its stockholders dividends amounting to 22 per cent., and the public bought its shares at 147. At the bottom of this prosperity and confidence was a Land Grant of 2,595,000 acres. The Northern Pacific Road's grant is six times as large per mile and *twenty times* as large in the aggregate as the Illinois Central's; and on the question of the comparative *intrinsic* worth of the two grants, we have the published opinion of John Wilson, Esq., who was long at the head of the Land Department of the Illinois Central Road. Mr. Wilson says:

> With all the information I have collected, and an experience enjoyed by but few, I consider the Grant to the Northern Pacific Railroad worth from fifty to one hundred per cent. per acre more than the Central's. Comparing this Grant with that of the Illinois Central, I think it a small estimate to say that if this Grant is properly managed, it will build the entire Road, connecting with the present terminus of the Grand Trunk, through to Puget Sound and head of navigation on the Columbia—fit out an entire fleet of sailing vessels and steamers for the China, East India, and coasting trade, and leave a surplus that will roll up to millions.

The Kansas Pacific Railway has adopted the policy of disposing of its lands principally to an influential Immigration and Land Company, so as to force the early settlement of the region through which it runs. In 1869 it disposed in this way of 428,568 acres, at prices varying from $1.00 to $8.00 per acre. The road received, on an average, $3.35 per acre for soil that is within the limits of what is described on American atlases as "The Great American Desert." The Immigration Company received for these lands an average of $4.31 per acre, which sum really should be the measure of their value for that year. During 1870 the Union Pacific Railroad Company sold 294,000 acres of land, at an average of $4.46 per acre.

The School Lands of Northern Minnesota will be in part within the limits of the Northern Pacific Railroad Grant in that State. The average price at which they were sold in 1865 was reported to the Minnesota Legislature as $6.30 per acre.

Now what is this landed empire of 50,000,000 acres worth? If it sells for only the low price per acre at which the Kansas Pacific Road forced off its lands, while it ran through and stopped in a wilderness of buffalo grass, the proceeds will be over $165,000,000. If nursed and sold on judicious credits, as were the lands of the Illinois Central, the proceeds would be, on the basis of that road's sales, $550,000,000! If sold at the average price of the Minnesota School Lands, the proceeds will be $350,000,000. The elements for appraising the market value of the Northern Pacific Land Grant sufficiently exist to make it absolutely certain that it can be sold for a sum much greater than the cost of constructing and equipping the road. The policy of the Company, however, will be to sell its lands at such moderate prices as to render their speedy absorption and settlement certain, rather than hold them for an extreme advance, at the expense of the development of the country.

SETTLEMENT—IMMIGRATION—COLONIZATION.

With the attractions of climate, soil, and scenery, which Nature has given the New Northwest, the simple building of the Northern Pacific Road would suffice ultimately to people the country along its line. Accessibility is about all that is needed to turn the tide of migration into this fertile region. Already thousands of settlers are following, and often preceding, the surveying and construction parties on the Road through Minnesota and Dakota. The same is true on the Pacific slope. As fast as the Road can be built, it will find a population already on its flanks. But, to render this natural movement certain, rapid, and constant, the Northern Pacific Railroad Company is organizing an Immigration Bureau in connection with its Land Department. The system adopted is practical, though new, and on a scale worthy of the great trust the nation has confided to this Corporation.

In carrying out the details of this scheme the Company will aim: 1. To employ as its Land and Emigration Agents, at home and abroad, only men of the highest character. 2. To permit no representations to be made by its authority which the facts will not fully warrant. 3. To promote, as far as possible, the formation of colonies, both in Europe and the older States of our own country, so that neighbors in the old home may be neighbors in the new; so that friends may settle near each other, form communities, establish schools, and, in short, avoid most of the traditional hardships which have usually attended pioneer life. 4. To exercise over emigrants, *en route*, whatever supervision their best interests may require, seeing to it that transportation charges are the lowest attainable, that accommodations on ships and cars are comfortable, that their treatment is kind, their protection against fraud, compulsion, and abuse of all sorts, complete, and that every dollar of unnecessary expenditure on the way is avoided, and the emigrant enabled to husband his means for the work of starting a homestead. The Company intend to complete the work of caring for the settlers who move to the line of their Road by furnishing lands at such moderate prices, and long credits, that the poorest need not remain landless; by aiding all who prefer it to secure homesteads from the Government domain; by transporting settlers, their families and goods at reduced rates; by seeing to it that all the elements of a sound civilization, including educational, church, and mail facilities, keep pace with the progress of the Road and the growth of communities.

POSTSCRIPT.

The facts regarding the climate and fertility of the Northwestern Belt are so opposed to prevalent inherited opinions, that it is difficult to tell the whole truth in these regards without appearing, to the uninformed, to exaggerate for a special purpose. Desirous of keeping considerably within, rather than pass beyond, the actual facts, we submitted that portion of this pamphlet which treats of the above topics to Mr. Lorin Blodget, author of *Blodget's Climatology*, and unquestionably the highest scientific authority on this subject either here or elsewhere. Mr. Blodget thus heartily corroborates the estimate herein given of the resources and capabilities of the Northwest. His testimony regarding the rain-fall along the Fertile Belt has special interest:

JAY COOKE & CO.

GENTLEMEN:—I have carefully reviewed, in the proof-sheets, the statements you make in regard to the climate and cultivable capacity of the great region tributary to the Northern Pacific Railroad. I have also examined anew the evidence and observations accumulated by me since the publication of the general volume from which you quote. I am therefore prepared to judge of the whole subject with proper caution, and to assure you that abundant evidence in detail can be furnished in support of the views I express.

I have no hesitation in saying that the anticipations you have of the future of that great section fall below, rather than exceed, the results that will be realized. Its advantages of climate and of soil alike are still imperfectly appreciated, even by those who have given most attention to their examination. The plains of a vast area there lie upon rich friable limestone; and, instead of the arid spring and summer which prevail over the plains of lower latitudes, there is here a fair and even an ample supply of rain at these critical seasons. It is the cold season that is conspicuously dry, and that reduces the annual quantity of rain to about 25 inches. I should now modify the illustrations of my rain maps for spring and summer, in the Northwest, by adding two or three inches to each, thus adding about 5 inches to the whole quantity for the year. No observations of rain-fall existed for that belt in 1857 when my charts were first prepared, and there was a constant exaggeration of the aridity of the plains generally pressed on the public by most writers and travelers.

The quantity of 8 inches of rain-fall each, for spring and summer, or 16 inches for the growing season, is as ample there for the purposes of agriculture as 24 inches would be at the 40th parallel.

From my earliest knowledge of that rich Northwest, derived from Sir George Simpson in 1851, and from all the scientific and other surveys subsequently conducted, I have been deeply impressed with the beauty, fertility, and mildness of climate in this future Germany of the American continent. The line of the Northern Pacific Road was claimed by me, long before Governor Stevens' survey was organized, to be naturally the most favored in the passage of the Rocky Mountains, in exemption from heavy snows, and in capacity for settlement along the entire line. It will open up a country long closed to general knowledge by the policy of the Hudson's Bay Company, but which is now universally admitted to be highly valuable. Its real merits, however, will only be properly known when it is actually occupied.

Very truly
And respectfully yours,
LORIN BLODGET

Philadelphia, Feb. 24th, 1871.

SOME VALUABLE OPINIONS.

DURING the debate in Congress which preceded the passage in May, 1870, of a Joint Resolution conferring certain additional privileges upon the Northern Pacific Railroad, a number of Senators and Representatives felt constrained to oppose the measure. The opposition was zealous and long-continued, and was based mainly upon the ground that the Land Grant of the Company was already amply large and valuable to pay the entire cost of building and equipping the Road. Better evidence of the value of the Company's grant of land could not be desired than the admissions of its opponents. A few of these we give below.

In the Senate, March 2d, Mr. Casserly, referring to the Northern Pacific Railroad land grant, said:

> An empire in itself, I beg, gentlemen, to observe. More than that, it is the very richest land grant, by a large percentage, which any railroad company has been fortunate enough to obtain. In proportion to its whole extent, vast as that is, it contains more good arable land than any other large railroad grant, except the grant to the Illinois Central Railroad, in 1850.

Mr. Harlan, of the Senate, placed this opinion on record:

> These lands are valuable lands. No person can study the topography of the country, can bring to bear his knowledge of climatic influences, without knowing that these plains are fertile, that they are clothed with grass and timber; that it is a vast and valuable grass-producing and grain-growing region; a large proportion of it covered with forests, the like of which cannot be found elsewhere on this continent, from which the great commercial Powers of the world are now obtaining the timber out of which they construct their merchant fleets. This is the character of the domain already granted. I say it is good; it is valuable; it is worth untold millions of money, and will produce it just so rapidly as the Railroad shall have been constructed, in order that purchasers may reach it and bring it into use.

Mr. Hawley, of the House of Representatives, said:

> * * * And not only that, but it is a country which produces all kinds of fruit in the greatest abundance, and it is a land where stock can be kept without any housing. The greater portion of the country through which this Road runs has a climate so mild that stock is wintered there without any feeding or shelter.

Senator Howell, of Iowa, with a practical knowledge of the value and rapid appreciation of Western lands in the vicinity of railroads, said:

> I think that when this Road is extended and built, as it will be gradually from each side, from the ocean and from Lake Superior, as it progresses towards the centre the greater portion of the land will become as valuable as the land in Iowa through which our railroads run.* You claim that the land is good land. It is universally understood that the land is good.

Of the western portion of this Grant, Hon. Sidney Clarke, of Kansas, another expert in the value of Western lands, expressed this opinion in the House of Representatives, May 25th:

> Why, sir, the facts are, that on the western slope of the Rocky Mountains, through Washington Territory to the Pacific Ocean, which this Road penetrates, stretching out in all directions, the most dense and valuable forests in the world are to be found, which will be worth eventually several hundred million dollars. Our forests are becoming rapidly depleted, so rapidly, indeed, that within the short space of fifty years one of the most important questions which will be submitted to legislators and to the political economists of the country will be, how this great and necessary element of wealth, power, and convenience can be maintained against this rapid destruction and depletion. I have no hesitation in saying, Mr. Speaker, that in all this belt of country west of the Rocky Mountains, there is a forest which, opened up by railroad, will, for the purpose of shipbuilding and for all the purposes of commerce at home and abroad, be worth hundreds of millions of dollars, however extravagant these figures may seem at the present time.

We could fill a volume with similar extracts from the debates in Congress, but have only space for the following unsolicited testimony of Hon. Allan G. Thurman, of Ohio, given in the United States Senate:

> *Why, sir, I affirm, and affirm without fear of successful contradiction, that the grants made by the charter of this Company to the Company will defray every dollar of expense of building and equipping the Road, so that the result of the whole thing is simply that the Government builds and equips this Road and gives it to a private corporation.* Say what you will about it, argue as much as you please upon it, talk as much as you choose of the advantages to the country of the Road, the simple, naked result of the whole thing is that the Government builds and equips the Road and gives it to a private corporation to be a monopoly in the hands of that corporation. That is the whole of it.

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* Iowa lands adjacent to lines of railroad are worth from $10 to $25 per acre.

FUTURE BUSINESS OF THE ROAD.

THE Northern Pacific Railroad will centrally traverse and draw its traffic from a fertile belt of country 1,800 miles long and at least 700 in width, which is now wholly unsupplied with railroads or other adequate means of transportation. For the carrying trade of this vast region the Northern Pacific Railroad will have no rival. The existing line to the Pacific has an ample field for a prosperous business of its own; and, owing to insurmountable difficulties of surface and climate between Lake Superior and James' Bay, a trans-continental road through the British Possessions, north of the Northern Pacific route, will not be seriously contemplated by practical people.

Will a country of this extent and character furnish a sustaining business to one line of road? The question answers itself. But the case does not rest on this general inference alone. The States, Territories, and Provinces dependent upon the Northern Pacific Railroad as their thoroughfare of travel and traffic are already populated to a very considerable extent, and enjoying fully organized local governments. The country directly tributary to the Northern Pacific Road contains quite as many people as did the States and Territories traversed by the first Pacific Road when it was built, while the producing capacity of the Northern belt is at least five fold greater than that of the Central.

It was predicted that years would elapse before the Union and Central Pacific Roads could reach a paying business. Look at the facts: Although built by the longest line between the Lakes and the Pacific ocean, through a belt of country much of which cannot be occupied, and over a mountain region presenting great elevations and most difficult grades, these two roads, which for commercial purposes may be regarded as one, earned enough in their *first full year of through business*, over and above running expenses, to pay six per cent. interest on a fair estimate of their cost. How many roads in any part of the country can make a better showing? The official statement of the earnings and expenses of the Central Pacific Road during six years is as follows:—

	Miles operated.	Gross Earnings.	Operating Expenses.
1865,	31 to 56	$401,941 92	$121,669 53
1866,	56 to 94	864,917 57	200,710 61
1867,	94 to 137	1,470,653 50	330,913 33
1868,	137 to 468	2,300,767 17	843,166 54
1869,	468 to 742	5,670,822 25	2,993,523 19
1870,	742 to 900	7,920,710 98	4,060,564 95
	Total,	$18,629,813 39	$8,550,548 15

During the same period of six years the net earnings, the interest on bonded debt, and surplus of net earnings over interest liabilities were as follows:

Net earnings,	$10,079,265,24
Interest on bonded debt,	4,184,221,00
Surplus of net earnings over interest,	$5,895,044,24

The financial representatives of the Road make this comment on the above figures:—

> From the foregoing tables it will be seen that the Central Pacific Railroad has earned, in six years, more than $10,000,000 *Net* over operating expenses, and nearly $6,000,000 *over operating expenses and interest on its Bonds;* while, during *four years and a half* of that time, the Road was under construction, without through business, and, for the first three years, with less than 100 miles in operation.

It would have been difficult, before the construction of the present Pacific Road, to say of what would consist the enormous traffic it at once obtained and now enjoys, yet sagacious men knew the business was awaiting the Road. The builders of the Union and Central Pacific Roads deserve much credit as the pioneers of a great movement. They took the risk of a vast experiment, and their demonstration of the feasibility and profitableness of a trans-continental road by a most difficult route, has rendered comparatively easy and wholly safe the construction of a second road, on a short line, with easy grades, and through a country of singular mildness, fertility and variety of resources. The success of the first being already proved, the success of the second, under the circumstances, is doubly assured.

To enumerate some of the sources of that traffic which now awaits the completion of the Northern Pacific Railroad:—

1. The Road will command the vast interior trade that now supports nineteen steamers of the Oregon Steam Navigation Company, which navigate the lower Columbia, the upper Columbia, Clark's Fork, the Snake River, Lake Pend d'Oreille, and Puget Sound. The dimensions of this traffic in Oregon, Idaho, Washington and Montana may be judged by its profitableness. The Company was organized in 1860, with a capital of only $172,400. Up to June, 1869, it had expended over $2,000,000 in the construction of steamers, railroads around the Dalles and Cascades, wharves, etc., and paid its stockholders, besides, over a million of dollars in gold as dividends.

2. Of the existing Lumber trade of Puget Sound, westward by sea, we have given a glimpse. The Railroad will create a proportionate trade eastward. The shipments of lumber, by vessel, from Puget Sound in 1870 equalled 18,000 car loads, or 900 trains of 20 cars each. And this traffic is yet in its infancy. What must it contribute to the business of the Northern Pacific Railroad?

3. The Railroad will do most of the business now done by steamboats on the upper Missouri and Yellowstone rivers. That business is of long standing and very considerable amount.

4. It will take the bulk of the large business now done all over the Northwest by pack-animals and wagon-trains. It will perform the most profitable part of the mail service of five States and Territories, and will ultimately carry the Chinese and Japanese mails.

5. It will take the place of the present wagon service in transporting supplies to the twenty-eight northern military posts—a service which has cost the Government between Six and Seven Million dollars yearly. In this way alone it will save to the nation at least Three Million dollars annually, or three per cent. on the entire cost of the Road.

6. Where the Road crosses the Red River of the North it taps 1500 miles of inland navigation, down the Red River, through Lake Winnipeg, and up the Saskatchewan to the foot hills of the Rocky Mountains. Light draft steamers have long navigated this route. Along the greater part of this water-way the soil is good, the climate like that of Minnesota, and the settlements numerous. The trade of this vast region beyond the national boundary, including the transportation of supplies for the Hudson's Bay Company, will at once and permanently form part of the business of the Northern Pacific Road.

The Hudson's Bay Company and Winnepeg settlers have hitherto shipped their supplies over the St. Paul branch of the Northern Pacific

Road to its present terminus, and thence transported them with teams 150 miles to the nearest steamboat landing on the Red River.

7. The tide of emigration, already pouring into the country now opening to settlement, with the thousand needs of new and thriving communities, will contribute a large revenue to the Road.* For many years the transportation of settlers, their families, goods and supplies (though done at low rates) to all parts of the Fertile Belt adjacent to the Northern Pacific line, will form a constantly increasing source of income to the Company. As a route for tourists the Northern Pacific must always be popular. The summer pleasure travel over the line will be increasingly great.

8. The shipment of cattle over the Northern Pacific Road promises to equal that upon any line in America. The grazing lands of the Fertile Belt are admittedly unsurpassed in character and extent. The "bunch grass" covers valleys and mountains. It is grass in summer and cured hay in winter. No drouth kills it—no heat diminishes its nutritive qualities; wherever it grows cattle require no other food throughout the year, and thrive without shelter. Stock raising will continue to be, as it now is, one of the most lucrative branches of business in the Northwest, and with this great thoroughfare furnishing quick transportation to a ready market, this interest cannot but reach enormous proportions. The experience of the Kansas Pacific and Union Pacific Roads, in suddenly developing an extensive trade in cattle from the Southwestern plains furnishes a suggestion of what may be expected by the Northern Pacific Road.

9. The grain-producing capacity of Minnesota is well known. The Northern Pacific Road and its branches will drain two-thirds of the wheat-lands of Minnesota, and the trunk line will traverse, on its way to the Pacific, many million acres of equally good soil. Indeed, the Road may be said to traverse, and open to the world's markets, that region which, at a very early day, is to furnish the bulk of the surplus wheat crop of the United States. How much business must the grain-product of the Northwest, present and future, furnish to the Northern

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* A late number of the St. Paul *Pioneer*, speaking of the tide of population already pouring to the line of the Northern Pacific Railroad, says:

"The Roads leading to the Red River Valley are literally covered with emigrant wagons, with their usual accompaniment of families, furniture, and stock of all kinds. The wagon roads from Sauk Centre to St. Peter show daily accessions to the vast caravan wending its way to the fertile regions of Northern Minnesota. The extent of the great incoming tide of humanity can be best estimated on the main road between Alexandria and Pomme de Terre. Two hundred wagons per day pass over this portion of the route northwest, and the camp fires are seldom allowed to go out—a fresh train of emigrants arrive almost as soon as its predecessor has resumsd its march. A noticeable feature of this years's emigration is its quality—the wagons come loaded with household goods and farming implements, and are followed by herds of cattle and other stock which in quality would do credit to any country. Fully twenty thousand settlers have located on the line of the Northern Pacific Railroad in western Minnesota during the first half of 1871."

Pacific Road? With one-fiftieth part of her lands under cultivation, Minnesota alone exported grain enough in 1870 to load 2,500 trains of 20 cars each.

10. The many navigable rivers crossed and recrossed at convenient intervals by the Northern Pacific Railroad, will contribute to it a large traffic by bringing in the trade of the country for many miles on both flanks. For example, on the Pacific slope, the waters of Puget Sound, the Cowlitz river, the Williamette, the lower and upper Columbia, the Snake, the Clark, and Lake Pend d'Oreille—all will serve as feeders and outlets for the concentration and distribution of freights and passengers upon and from the great central thoroughfare, the Railroad. From the head of navigation on the Columbia's branches it is only 230 miles across the mountain country to the navigable waters of the Missouri on the east. This stream and the Yellowstone drain large tracts of fertile country, and both will bring their tribute of trade to the Railroad where rail and river intersect in Dakota. Two hundred miles further east, the navigable Red River is crossed, bringing to the Road, as elsewhere stated, the trade of 1,500 miles of valley lands. At their eastern termini, the two arms of the Northern Pacific Railroad connect with the commerce of the Mississippi at St. Paul, and the commerce of the great Lakes and the St. Lawrence at Duluth on Lake Superior.

This lake and river system of the Fertile Belt is obviously an important element in the assured success of the Road, giving it the practical advantage of eight or ten side branch lines, without the expense of building them. But the Central and Union Pacific Road has proved a business success without having a single navigable stream tributary to it between Sacramento and Omaha—1,775 miles.

11. The Mining interest of Montana, Idaho and Washington will at once furnish a large share of traffic to the Northern Pacific Road, and, with cheap transportation and the introduction of improved machinery, this branch of business will steadily increase. The fact, elsewhere noticed, that the product of the Montana, Idaho and Washington mines was over Twenty Million Dollars in 1870 indicates the richness of the deposits and the permanent nature of this industry. The shipment of supplies for the mining population, and the transportation of their products eastward, will in all probability render the mountain section of the route more profitable to the Road than any equal extent of agricultural country.

What the coal traffic is to many Eastern roads, the transportation of ores promises to be to the Northern Pacific. Already the Union and Central Pacific line derives a very considerable revenue from this trade—carrying the ores of the precious metals from the mines to the smelting works at San Francisco and on the Atlantic seaboard. Ten thousand tons of ores, assaying from $200 to $1200 per ton, now pass over the Central and Union Pacific Roads monthly. The authorities of these roads estimate that when the smelting works are enlarged to the proper capacity, not less than 1000 tons of ore per day will be shipped over their line. The well-known richness and extent of the mines adjacent to the route of the Northern Pacific Road give assurance that it will derive as great a traffic as the Central from this source.

12. Too much importance is not attached to the matter of through business between the ports of Asia and our Atlantic Coast, experience

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The Chicago *Journal*, in an intelligent review on the Pacific Railroads, says:

The census returns of 1860 gave 460,112 as the sum total of the population of Nebraska, Wyoming, Utah, Nevada and California—the district now traversed by the Union and Central Pacific Railroads. Work was commenced on the road, at both ends, in the winter of 1863. Between the two dates mentioned, owing to the war, it is evident that the far West could not have received much of an addition to its population. Looking back now, it is easy to see why so many of its friends, even, prophesied that financially the road would be a failure. They regarded the enterprise as one of political necessity, but could see no money in it. Its route, for the most part, lay through a wilderness incapable of agricultural settlement. Of the whole number of inhabitants above given all but 90,118 were in the State of California.

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The earnings of the Central and Union Pacific Railroad were Fourteen Millions in 1870—the net receipts over operating expenses being in excess of Six Millions. In other words, in the first year of its through business it earned enough over and above running expenses to pay six per cent. on a fair estimate of its cost. In six years the Central Pacific (forming one-half of the through line) has earned Ten Millions net, being nearly Six Millions more than the interest on its Bonds and all the cost of operating. Sixty five per cent. of this came from local traffic, and one year only of through business is included in it. The authorities of the Central Pacific estimate the earnings of their road for 1871 at Ten Millions, and President Thomas A. Scott, of the Union Pacific, places the earnings of that road, this year, at Nine Millions, making $19,000.000 for the through line from San Francisco to Omaha. Of this at least $9,000,000 will be net above running expenses, or 9 per cent. on a reasonable estimate of the entire cost of the road. The first mortgage bonds of the Central Pacific, bearing six per cent. interest, and secured only on the road, are now selling at 103. So oppositely to all expectation has the operation of the road turned out!

Since the commencement of the Union and Central Pacific, San Francisco has grown from being a city of sixty thousand inhabitants to be a city of a hundred and fifty thousand. But, including that, a total population of the belt of States and Territories through which the road runs is only 788,270. And this number of people, with aid from a portion of Colorado (population 39,681) furnish business to the Union and Central Pacific at the rate of Fourteen to Nineteen million dollars per year. This brings up the rather curious question, How many inhabitants are necessary in a given district to make a railway pay?

And now comes the Northern Pacific, certainly with greater probabilities of success than were before the Union and Central Pacific. While it equals the other in mineral wealth, the country through which it runs is vastly more inviting to the farmer. Indeed, testimony shows it to be of special agricultural value. Leaving out California on the Union-Central Pacific, and also excluding Minnesota on the Northern Pacific, and the latter road has 104,752 more people to contribute to its local business than awaited the opening of the Union and Central Pacific, and only 23,592 less than give support to the latter road now.

Including those two States, which would not be unfair, inasmuch as the Northern Pacific will have in Minnesota, with its main and branch lines, over eight hundred miles of road, draining two-thirds of the entire State—including these two States, the tributary population of the Northern road in all is 639,433, or 179,321 more than were at first reached by the Union-Central Pacific, and only 148,837 less than give aid to it now.

But the figures given are suggestive. What, principally within the last five years, has added 100,000 to the population of San Francisco? Surely nothing so much as the summons of iron knocking at the Golden Gate. If a road can add 100,000 people in five years to an existing city, cannot another one in the same time build up a city of 100,000, especially if, by reason of its shorter oceanic distance, it is demonstrated that it will necessarily control foreign shipments?

Few doubt that if the land lying along the Union Pacific had been as available for agriculture as the lands of the Northern Pacific, the population along the route would have trebled as well as that of its terminal city. Here, then, the case will probably stand:—The Northern Pacific, on its completion, will find a flourishing city awaiting it on Puget Sound, inferior, of course, in size, to San Francisco, but still a thriving, well-grown city, as helpful to it as the other to its Southern compeer. It will, during its progress, on account of its fertile lands, more than quadruple the population west of Minnesota, and so bids more than fair to equal the first through business of the Union and Central Pacific, while for the succeeding years its returns will be vastly greater.

having shown that Local Traffic must always be the main reliance of all great thoroughfares. But, whatever shall be the future volume of the Asiatic trade by rail across this continent—and it will unquestionably be large—the Northern Pacific Road is sure of its full share. Its advantages in this regard are as conspicuous as in others. It spans the continent from the great Lakes to the Pacific by a line 500 miles shorter than the present finished road; and, owing to the less distance and the prevailing winds and currents of the Pacific Ocean, the sailing time between Puget Sound and the ports of China is four to seven days less than between San Francisco and China. The Northern Pacific Railroad is in the direct line of the "highway of nations."

Such is a partial enumeration of the sources from which the bulk of the carrying trade of the Northern Pacific Railroad is expected to come. Many items, as important as some of those mentioned, have been omitted; the case is strong enough as it stands. If this exhibit seems rose-colored, it is the fault of the facts themselves, which refuse to take on any other hue! It is impossible to belittle the advantages and the future of the Road without misrepresenting both.

THE NORTHERN PACIFIC RAILROAD.

WILL IT PAY?

By HON. SCHUYLER COLFAX,

Vice-President of the United States.

A little over five years ago, Messrs. Bross, Bowles, Richardson, and the writer hereof, made a stage-coach journey from the Missouri River to California, and thence up the Pacific Coast, through that State and Oregon and Washington Territory, to Puget Sound and Vancouver's Island. When we returned, we all stated to the public that the Pacific Railroad could be and ought to be completed within five years; that it could be run as regularly and uninterruptedly as our Eastern roads; that the subsidy and the land-grant proffered by Congress were sufficient for its construction: and that its receipts would be largely in excess of its expenses from the very day on which it should be opened for travel and freights. Very many doubted the correctness of these statements. But they have been more than verified. In but little over half the time suggested the railroad became an established fact. Its trains have been run with great regularity and freedom from accident. And the avails of its land-grant, when realized, will, with the subsidy bonds received from the Government, cover all the actual cost of construction.

But, if we had predicted, in addition, that the total receipts of the railroad line from Omaha to San Francisco, operated by the two companies, (the Union and Central Pacific), would be, as they prove to be, FOURTEEN MILLIONS OF DOLLARS PER YEAR, and the *net* receipts over expenses SIX MILLIONS PER YEAR, would not nine out of every ten have turned incredulously away? Their estimates for 1871 reach the still larger sum of sixteen millions gross and eight millions net, even with the competition, at each end of the line, of the Kansas Pacific road on the east and the California Pacific on the west; and I do not doubt that these estimates for the coming year will be realized.

All experience in this rapidly-growing country has proven that the locomotive is not only the civilizer, but the developer of our states and territories. Wherever its pillar of cloud by day and its pillar of fire by night are seen, and wherever stern Nature does not positively prohibit it, immigration is invited, villages and cities spring up, agriculture and the mechanic arts thrive, water-power is utilized, manufactories are established, resources are developed, business is literally created, and the waste places are isolated and solitary no more. Take a region through which a daily stage-coach has heretofore been supported. Build a railroad. And, unless the locality actually forbids settlement or business, as a marsh or land absolutely untillable, the passenger and freight trains on the line will within a few years be far beyond all original estimates. Build another road, and another, on lines twenty to fifty miles distant, and the same results follow, without affecting, in any marked degree, the original line.

In fact, the railroad development of the United States is one of the most wonderful of the wondrous incidents of its history, and one of the most potential elements of its extraordinary advance in all that makes a nation great. Thirty years ago, when there were no railroads in Indiana or Illinois, I heard an ex-governor, in a public address at Indianapolis, prophesy that, within the lifetime of some of his hearers, that city, with then but a few thousand inhabitants, would become the hub of a great railroad system, lines of road running from it in every direction, like the spokes of a wheel from the hub. This prediction was laughed at as the dream of a crack-brained enthusiast. Not only, however, has it been literally fulfilled, but whoever will look at a railroad map of those two states will, even if they reside within their limits, be surprised when they aggregate together the number of miles of railroads built and being built, where but thirty years ago they were so utterly unknown.

I know that some of the many railroads in the United States have not reimbursed their builders. Extravagant prices for construction, heavy discounts on bonds, ruinous competition with other lines, and reckless mismanagement, have rendered some of them poor pecuniary investments. But I doubt whether *any* railroad can be found that has proved a loss, considered in its relations to the aggregate wealth of the nation. Even if every dollar expended in its construction were lost, I doubt if there is any railroad now in operation which has not *raised the value of the lands along its line to the full amount of its cost*, saying nothing of the benefits it has conferred on the people in quick and easy transit and ready and accessible market for all products of industry, as compared with the opportunities of "the olden time." That the powers of railroad companies are sometimes wielded oppressively does not impair the strength of this statement.

But the question proposed to be considered in this article relative to the Northern Pacific Railroad is, "WILL IT PAY?" Before the American people invest in great enterprises, no matter how important they may be to the development of national resources, the advancement of the Republic in power and wealth, and the founding of prosperous states to add to its glory, they carefully consider this brief but important question which I have used as a caption.

I. At the risk of being considered an enthusiast, as I was a few years ago, in regard to the Central line, I predict that all three of the trans-continental lines—Northern, Central, and Southern—will, under wise management, prove remunerative to their builders, as they certainly will to the nation. Hundreds of miles apart, they traverse our vast interior, waiting and ready for development—the future home not only of millions of our own population, but of the millions flocking to our open gates from the Old World. They have different and widely-separated termini on the

Pacific, as they have at this end of their respective lines. And each has advantages peculiar to itself.

II. The first advantage that can be claimed for the Northern Pacific is that it has no governmental subsidy bonds. No principal or interest of Government aid is to remain, upon its completion, an incumbrance, then or thereafter, upon its receipts. Every dollar that it earns for transportation, military or postal service for the United States, goes into its treasury, with its other receipts from passengers or freights. And thus the absence of subsidy bonds will prove hereafter a blessing instead of an injury to it.

III. Instead of the pecuniary aid given in bonds to the Central line, the United States magnificently endowed this line with a land-grant, double in its area to that conferred upon the other. Over fifty millions of acres in alternate sections were ceded to it to aid in its construction, with the power to mortgage them, as well as the road itself, and the right of selection extended to so wide a breadth of country that, unlike other land-grants, the company is sure to obtain the full amount intended to be conveyed. This "superb estate," larger than all New England, seven times as large as Belgium, is a free gift from the nation, and opens up to settlement an immense region, now comparatively unpeopled because inaccessible, while it renders the other fifty millions of acres reserved by the United States more than doubly valuable, instead of being, as it would be without railroad facilities, comparatively valueless for many years to come.

IV. The estimated cost of the two thousand miles of road from Lake Superior, *via* Portland, Oregon, to Puget Sound, with rolling stock, station houses, freight depots, and engine shops, is eighty-five millions of dollars. And it is not chimerical to suppose, as indeed was argued in Congress, that the avails of the lands granted to the company will be more than sufficient to build and equip the entire road.

The grant to the Illinois Central Railroad has realized about $11 per acre. But this would scarcely be a fair test of comparison. The Land Company, which is purchasing the lands granted to the Kansas Pacific Railroad, received last year an average of $4.31 per acre for the lands sold by them. The lands sold by the Union Pacific Railroad have averaged $4.46 per acre; and its new president, Thomas A. Scott, so widely known as one of the most sagacious and accurate railroad managers in the whole country, estimates the receipts for the remainder of the twelve millions of acres granted to it, good, bad, and indifferent, at $2 per acre, being twenty per cent. below the minimum Government rate for the reserved alternate sections. I do not doubt that the future will more than vindicate this careful estimate.

V. It will not be unjust to the two last roads to claim that the land-grant of the Northern Pacific Railroad, by its fertility and climate, exceeds theirs in value. Ex-Governor Ashley, who has travelled extensively over Montana, Idaho, Oregon, and Washington Territory, and has studied the remarkable results of the isothermal lines, compares the climate of Montana to Pennsylvania, of Idaho and Eastern Oregon to Virginia, and of the region beyond the Cascade Mountains up to Puget Sound to North Carolina; and my own observation of the latter region coincides with his. Indeed, the governor-general of Vancouver's Island told our party, in 1865, that summer flowers in their open gardens were not injured by frosts one winter out of four! Minnesota, through which the first 250 miles of the road run, has cold winters; but its reputation as a wheat-growing region and its healthful climate, are known of all men. Professor Blodget, in his great work, "The Climatology of the United States," says that the whole of that immense portion of the Union west of the 98th meridian and above the 43d parallel (which is almost exactly bisected by the Northern Pacific's line) "is perfectly adapted to the fullest occupation by cultivated nations, and has an immense and yet unmeasured capacity for occupation and expansion." Hon. E. D. Mansfield one of the highest authorities on statistical, industrial, and climatic questions, says: "The climate of the region from the Upper Missouri to the Saskatchewan (northwest of Montana) is exactly that which in Europe is deemed the best for grain-growing." And Hon. J. S. Wilson, late Commissioner of the Land Office, endorses the opinion of Gov. Stevens, that "not more than one-fifth of the land from Red River to Puget Sound is unsuited for cultivation, and that this fifth is largely made up of mountains, covered with bunch grass and valuable timber, and filled with the precious metals;" and Mr. W. himself adds: "An immense agricultural area is here awaiting development. Each section of the road, as completed, will, from local traffic alone, find ample returns for its investment."

VI. Valuable as this land-grant is, therefore, as an ample security for the bonds based on it, in addition to the security of the road itself, it is even more valuable to the future of the railroad as homes for the vast numbers of people who are to furnish its local traffic. Over a large portion of it cattle can roam unsheltered through the entire year, feeding themselves on what is "grass in summer and cured hay in winter;" and their raising and shipment, always a lucrative business where the cost is low and the market accessible and certain, will rank next to agriculture in its importance to the revenues of the road.

VII. I will not make any estimate as to its general way business, but merely throw together a few incidental references to it. The trade of the Valley of the Columbia is already large and steadily increasing. The wagon service of the United States, in supplying its twenty odd northern military posts, costs several millions per year. At Red River the Northern Pacific connects with steamboat navigation for the fertile Pembina and Saskatchewan regions of the British possessions. The navigable streams which it touches or crosses on both sides of the mountains give it the advantages of branch lines for the concentration and distribution of business. The mining interests of Montana, Idaho, and Washington Territory, estimated, even in their present inaccessibility, at twenty millions per year, will furnish a heavy business in freights, for supplies, machinery, shipment of ores, etc. And, without enlarging on this head, the fact that in 1870 eighteen millions of pounds of freight were wagoned 400 miles into Montana, over a rugged country, at a cost of fifteen cents per pound, gives a faint idea of the way business already waiting for the completion of this road.

VIII. The through business of this line will, I believe, exceed the moderate estimates of its projectors. It has the advantage, at its eastern terminus, of its connection, not only with the railroad system of the Northwest, at St. Paul, but with the head of our chain of lakes (far west of the longitude of St. Louis or Galena), with their water-way, at cheap rates, during the seven months of the year, from the very centre of the continent to the Atlantic Ocean. By the Central Pacific line it is twenty-four hundred miles from Chicago, at the head of Lake Michigan, to San Francisco. By the Northern Pacific it is only two thousand from the head of Lake Superior (as near to Buffalo as is Chicago) to Puget Sound. [By the direct line across the Cascade range it will be less than eighteen hundred miles.] And at Puget Sound vessels are at least two days nearer to China than at San Francisco. The highest elevation on the Northern Pacific line is five thousand feet above the sea. Where the Central line crosses the Rocky Mountains the elevation is eight thousand and at the Sierra Nevada seven thousand feet above the sea, with an ascending grade, coming east, of over one hundred feet per mile for seventy miles. This advantage of distance and grade cannot fail to largely affect the through freights from the Far East, which are to cross our continent on their road to the interior, the Atlantic, or to Europe. Besides this Asiatic trade, and the trade of the North Pacific coast, the salmon fisheries of Puget Sound and the Columbia are absolutely exhaustless, as every one knows who has seen the innumerable quantities of them which literally crowd the water courses; and the shipment of them in a cured state will doubtless be immense.

IX. Finally, as the road will be pushed forward to completion as rapidly as a judicious economy of means will allow, millions will not be wasted in undue haste. The rapid construction of the Central line, after the two companies building it were fairly under way, was almost the wonder of the world. Each desired to secure as many miles as possible; as the law enacted that wherever the iron rails met should be the junction, each holding what it had built and no more, and each receiving the subsidy bonds and land-grants accordingly. Never was such railroad building seen before. By night as well as by day, in all weathers, at any cost, and with supplies gathered from all parts of the United States, regardless of expense, the two companies quickly neared each other. Ten miles of rails were laid per day—an unheard of feat before. Hundreds of miles of the rival tracks were graded side by side, waiting for the ties and the iron. All that money and almost superhuman energy could achieve were accomplished. And, at last, at Promontory Point, on the borders of the Great Salt Lake, the locomotives from the West and the East met on their iron pathways, and the continent was spanned. But this contest of the giants necessarily cost millions on millions. Even with all its prosperous future before it, the Northern Pacific, free as it is from any such costly competition, can afford to husband its means, and construct its line rapidly, yet economically; and for this reason, as well as those I have really but glanced at in this article, I can answer the question with which I opened—" It *will* pay."—*New York Independent.*

Progress of the Road.

THAT portion of the road extending through Central Minnesota from the head of Lake Superior 266 miles to the crossing of the Red River, at the eastern boundary of Dakota, is fast approaching completion. A large force of men is engaged in finishing the grade, and the track is being rapidly laid. Very soon freight and passenger trains will be running regularly over this important division, connecting with the navigable waters of the Red River and Lake Winnipeg. A profitable business already awaits the opening of this section of the Road to the Red River Valley.

Within the last few months the Saint Paul and Pacific Railroad has been purchased by, and practically consolidated with, the Northern Pacific. The purchased line (main and branch) embraces some 300 miles of finished Road in full operation, on which a prosperous traffic is already doing. Both lines are indicated on the map accompanying this pamphlet. When completed, as they will be at an early day, the main line will extend from Saint Paul, through western Minnesota to Breckinridge or such other point as shall be deemed most advantageous, and the "branch" reaching from Saint Paul northwestwardly, will intersect the Northern Pacific line west of Crow Wing, and extend on to the British border at Pembina on the Red River, thus securing at once the carrying trade of British America. Work is rapidly progressing on both these branches. The purchased lines have liberal land grants through the richest parts of Minnesota, which accrue to the Northern Pacific Railroad Company, and the completion of these lines will give the Northern Pacific Company nearly Nine Hundred Miles of Road in this great State.

The effect of this consolidation is to remove all hurtful rivalry, and virtually give the Northern Pacific Railroad a double eastern terminus—one arm reaching to Saint Paul where it taps the commerce of the Mississippi River at the head of navigation, and connects with the Illinois and eastern system of roads; the other arm extending to Duluth, where it meets the commerce of the Lakes and the St. Lawrence.

In the meantime work has begun on the Pacific coast. A force of men is already engaged on the line between the Columbia River and Puget Sound, and hereafter the work will be prosecuted both eastward and westward as rapidly as shall be consistent with the best interests of the Road.

Including its purchased lines the Northern Pacific Railroad Company already has 460 miles of Road in operation, and this will be increased to 560 during 1871.

SPECIAL REPORT.

Of a Reconnoissance of the Route for the Northern Pacific Railroad, between Lake Superior and Puget Sound, via the Columbia River, by W. MILNOR ROBERTS, U. S. Civil Engineer.

WHEN, in 1869, the Directors of the Northern Pacific Railroad proffered us the Financial Agency of their Company, we felt it our duty, before accepting the trust, and before we instituted measures for the sale of the Securities of the Company, or became identified with this great work, to cause a thorough examination of the route to be made, by agents chosen and sent out by ourselves; and we did this, not because we did not place entire confidence in the representations made to us, or doubted the reports of the numerous and very able explorations already made in detail by men of the highest scientific and personal character, but because of our long-established rule to make "assurance double sure," and to take every precaution to avoid placing in jeopardy not only our own means, but the means of those who confide in our judgment.

We accordingly appointed U. S. Civil Engineer, W. Milnor Roberts, and associated with him a number of other gentlemen, with the request that they proceed to the Pacific coast, and, after a thorough examination of Puget Sound and the Columbia River—the two western termini of the Northern Pacific Road—proceed eastward along the general line of the road, *via* the Columbia River or the Snoqualmie Pass, to the passes in the Rocky Mountains, and thence to Fort Benton, and also to the valley of the Yellowstone.

Other parties, under Governor Smith, of Vermont, and Governor Marshall, of Minnesota, explored at the same time the already well-known route from Lake Superior west to the Great Bend of the Missouri; and General Hancock, the then military commander of the Northwest, having just returned from an extended tour along the Upper Yellowstone and the Missouri, furnished us detailed and accurate information regarding the intermediate portions of the route.

Our final determination to accept the Fiscal Agency of the Company was based upon concurrent favorable reports from these three sources.

SYNOPSIS.

Mr. Roberts and party first proceeded to San Francisco over the Union and Central Pacific Roads, and thence reached Portland, Oregon, by rail and stage-coach overland. In passing through Oregon, approaching Portland, Mr. Roberts was particularly struck with the beautiful appearance of the country, as an agricultural region, "already settled and cultivated far beyond our anticipations." Using Portland as a base, they explored the lower Columbia river, the shores and harbors of Puget Sound, the route for the branch line between Portland and the Sound, and ascertained the entire feasibility of crossing the Cascade Range at a convenient point north of where it is cut by the channel of the Columbia. They found numerous harbors on the Sound, any one of which would admirably serve the purposes of a vast ocean commerce and a great terminal city. Coal mines, several of which have been successfully worked for some years, were found at various points in Western Washington, showing that the fuel supply in that favored region is inexhaustible, even after its gigantic forests are swept away. To illustrate the enterprise and business-furnishing capacity of the thriving city of Portland, one of the western termini of the Northern Pacific Railroad, Mr. Roberts mentions this fact:—

> The Oregon Steam Navigation Company, originated here by a few gentlemen less than ten years ago, with a capital of about one hundred and fifty thousand dollars, now owns twenty steamers running on the Willamette River, up and down the Columbia River from Portland, on Puget Sound, on two different stretches of the Columbia above the Cascades, on Lake Pend d'Oreille, and on two different portions of Clarke's Fork of the Columbia. They own two portage railroads, of their own construction, one six and the other fourteen miles long, and their capital is now over two millions of dollars, besides paying large dividends.

The magnitude and promise of the lumber trade of Puget Sound is mentioned with surprise, and the statements in this regard made in Mr. Wilkeson's notes are fully corroborated. Mr. Roberts also adds his testimony as to the remarkable mildness and attractiveness of the climate of this portion of the Pacific slope. Of the future city which is to rise at the ocean terminus of the Northern Pacific Railroad, this is said:

> There is not anywhere else on the globe to be found an unoccupied field for the establishment and permanent support of a new great city, such as should form the terminus of a Continental Railroad, uniting the waters of the Pacific and Atlantic by the shortest line between the great Puget Sound indentation of the coast in the west

and the Lake Superior indentation of the coast on the east. Between these extreme points the distance by a direct line is only about 1,350 miles, being thirty degrees of longitude of forty-five miles to each degree, between the latitude of 46° and 48°

Having completed his survey of the coast region, Mr. Roberts proceeded eastward up the valley of the Columbia, on his way to the pass of the Rocky Mountains. Of the Valley of the Columbia, between Portland and the mouth of the Snake River, he says:

> On the greater portion of the way a good railroad, with low grades, can be built at moderate cost. There are some miles of heavy work, but my detail notes show that the miles of easy construction predominate so materially as to reduce the average cost within very moderate limits. One fact is of more value than many theories. The fact that a private company, in the very infancy of the white settlement of this portion of Oregon, constructed first-class railroads around two of the most difficult points in the valley—one six and the other fourteen miles long, thereby securing the control of traffic and passenger travel which has paid handsome dividends on the cost—is a practical proof of the feasibility of the route along the river.

Leaving the steamer at Wallula, and proceeding to Walla Walla, the party started thence on horseback for the mountain portion of their trip. They crossed the great plain of the Columbia (180 miles) to Lake Pend d'Oreille, explored that beautiful body of water in one of the O. S. N. Co's steamers (which seem to be omnipresent thereabout), then proceeded up the valley of Clark's River. This is the route now taken by packers engaged in transporting merchandise from Portland and other points to the mining regions of Idaho and Western Montana. At every point where there were settlements the utmost interest was manifested in the Northern Pacific Railroad, which they regard as the only means of developing the great natural wealth of the interior Territories, and rendering their resources of some value to the world.

After reaching the dividing ridge of the Rocky range, Mr. Roberts spent some days examining the various Passes—Deer Lodge, Bozeman's, and Cadotte's—and the approaches to each. [Deer Lodge Pass is the most southern, and has a probable elevation of 5,000 feet above the sea; Cadotte's is the most northern, and has a considerably greater altitude; Bozeman's is a subordinate pass, east of Deer Lodge, on the same route, and has an elevation of 4500 feet.] Of the remarkable Pass at Deer Lodge, well named the Gate of the Mountains, Mr. Roberts says:

> The whole forty miles from Deer Lodge City *to the summit of the Rocky Mountains, by this route, can be built as cheaply as roads are built through prairie countries*

generally. A little more work will be required in passing on the east side, down Divide Creek to Wisdom or Big Hole River; but the line will be highly favorable as an average all the way down to the Jefferson Fork of the Missouri River. * * *

A remarkable circumstance connected with this Pass will convey a very clear view of its peculiarly favorable character. Private parties engaged in gold mining, in the gold field which exists abundantly on both sides of the Rocky Mountains, have dug a ditch across this summit which is only eighteen feet deep at the apex of the divide, through which they carry the water of "Divide Creek," a tributary of the Missouri, across to the Pacific side, where it is used in gold washing, and the waste water passes into the Pacific Ocean. This has been justly termed highway robbery. The route running down the Jefferson Fork, crossing the Madison Fork over to the Gallatin, and up that valley to near the Bozeman Pass, is very favorable, admitting of easy grades and curves at moderate cost. Some heavy work of grading occurs on both sides of Bozeman's Pass.

The Bozeman Divide is not so favorable as that at the Deer Lodge Summit, from the fact that the ascent to it on either side is less gentle, though, in comparison with other Passes of the mountains, it is quite favorable, being practicable without the aid of a tunnel, with no more costly approaches.

PROBABLE COST OF THE ROAD.

On this important point the Report says:

The line upon which the estimate is to be given runs from the head of Lake Superior across the Mississippi, the Red River, and the Dakota River to the Missouri; thence crossing the Missouri into the valley of the Yellowstone, and along that stream to Bozeman's Pass, through the Belt range of mountains; thence down the Gallatin valley, crossing the Madison River, and over to the Jefferson valley, and along that to the Deer Lodge Pass of the Rocky Mountains; and along Clarke's valley to Lake Pend d'Oreille; and from the lake across the Columbia plain to Lewis or Snake River; down that to its junction with the Columbia; along the Columbia River to the Cowlitz River; up the valley of the Cowlitz, and down to Puget Sound at its southern extremity, whence the road may be carried along either side or both sides of the Sound, as far as may be desired, to any port or ports which shall be selected.

Although I would not feel prepared without having the results of further surveys to pronounce this the best possible route which can be found between Lake Superior and Puget Sound, it certainly presents important advantages, and *is known to me to be eminently practicable.* Shorter routes may be traced; but probably none which will be cheaper per mile, or which will offer so good a profile for profitable service as a great main trunk Railroad thoroughfare.

In making this estimate, I assume that the graded road-bed, bridges, culverts, etc., are to be such as we find on our first-class roads; and that the track is to be thoroughly constructed, with rails of sixty pounds per lineal yard, put together with the most improved joint-ties, and completely ballasted with gravel or broken stone.

APPROXIMATE ESTIMATE.

No. of Div.	DESCRIPTION OF DIVISION.	Length, Miles.	Estimated Cost.
1.	Lake Superior to Yellowstone River, . . .	550	$13,750,000
2.	Along the Yellowstone to Bozeman's Pass, .	420	11,760,000
3.	Bozeman's Pass to Hellgate River, Mountain Division, ...	225	9,000,000
4.	Hellgate River to Pend d'Oreille Lake, . .	205	7,000,000
5.	Pend d'Oreille Lake to the mouth of Lewis River, ...	223	7,500,000
6.	Mouth of Lewis River to Puget Sound—Columbia Valley Division, ...	377	11,310,000
			$60,320,000
	Add for sidings and additional track, ...		4,200,000
	Contingencies, including superintendence and engineering, 10 per cent., ...		5,000,000
	Telegraph line and instruments, complete, $300 per mile, .		600,000
			$70,120,000

	BUILDINGS.		ESTIMATED COST.
134	Wood and water stations, ...	@ $3,500	$469,000
20	Engine-houses and turn-tables, ...	@ 15,000	300,000
5	Principal engine repair-shops, ...	@ 100,000	500,000
2	Principal car repair-shops, ...	@ 75,000	150,000
5	Principal car repair-shops, ...	@ 40,000	200,000
200	Section, tool, and hand-car houses, ...	@ 500	100,000
134	Freight and passenger stations, ...	@ 2,000	268,000
150	Freight platform stations, ...	@ 500	75,000
10	Principal freight and passenger depots, . . .	@ 25,000	250,000
			$2,312,000

	ROLLING STOCK, ETC.		
120	Locomotive engines, freight and passenger, . .	@ $13,000	$1,560,000
100	Passenger cars, first class, ...	@ 4,000	400,000
50	Passenger cars, second class, ...	@ 2,500	125,000
30	Smoker's cars, ...	@ 3,000	90,000
30	Baggage, mail and express cars, ...	@ 2,000	60,000
1500	Box, freight, cattle, and platform cars, . . .	@ 800	1,200,000
40	Caboose and wrecking cars, ...	@ 1,200	48,000
20	Tool cars, ...	@ 800	16,000
80	Hand cars, ...	@ 200	16,000
	Tools, snow-ploughs, etc. (per 100 miles), . .	@ 1,000	100,000
			$3,615,000

In addition to the foregoing, there are various outlays, which will necessarily attach to the work during its progress, not covered in the items given, or included under the usual percentage allowed for contingencies, especially at the principal terminal points on Lake Superior and Puget Sound, and on the Columbia River, and likewise at the crossings of the Mississippi, the Red River, the Dakota River, and the Missouri River, to connect the Railroad business conveniently with the transportation to and from these respective streams.

Also, on the route on which this estimate is predicated there would be a branch line, a few miles in length, extending to Portland, Oregon. In case the line should be along the Columbia River at Fort Vancouver, it would be only about five miles across to Portland, but involving two costly bridges, one over the Columbia, the other over the Willamette River.

In order to cover the cost of such a branch, and the cost of the necessary extra works above mentioned, it will be proper to add to the general estimate the sum of $1,200,000 for the branch, and $800,000 for the extra works referred to—making two millions in all. Nothing has been inserted for "right of way," as the land-grant carries with it all that is needed over nearly every foot of the line; and where land is taken up, the owners will gladly give the Company all they may require, in consideration of the benefit to the remainder.

RECAPITULATION.

Grading, masonry, bridging, track and ballast,	$60,320,000
Sidings, etc.,	4,200,000
Contingencies, including superintendence and engineering,	5,000,000
Telegraph line,	600,000
Buildings,	2,312,000
Rolling stock,	3,615,000
Branch road,	1,200,000
Extra works, etc.,	800,000
	$78,047,000
Interest on bonds over receipts during construction,	7,230,000
Total,	$85,277,000

This gives an average of $42,638 per mile.

GRADES—DISTANCES—SNOW.

Mr. Roberts illustrates the favorable gradients of the Northern Pacific Railroad route, by comparing them with those of the Union and Central Pacific line, the obvious inference being that, as the latter route has already been proved a practicable one for a profitable thoroughfare, the former must be pre-eminently so. On this question of grades, the Report says:

An examination of the profile of the Union Pacific and Central Pacific lines between Omaha and Sacramento, a distance of 1775 miles, shows that there are four main summits; Sherman summit, on the Black hills, about 550 miles from Omaha, 8235 feet above the sea; one on the Rocky Mountains, at Aspen summit, about 935 miles from Omaha, 7463 feet; one at Humboldt mountain, about 1245 miles from Omaha, 6076; and another on the Sierra Nevada (only 105 miles from the western terminus at Sacramento), 7062; whilst from a point west of Cheyenne to Wasatch, a continuous length of 450 miles, every portion of the road is more than 6000 feet above the sea; being about 1000 feet, on this long distance, higher than the *highest summit* on the Northern Pacific Railroad route, whilst for the corresponding distance on the Northern Pacific route the average elevation is under 3000 feet, or 3000 feet less than on the Union and Central line. The highest summit on the Northern Pacific line is about *three thousand feet* lower than the Sherman summit on the Union Pacific line.

On the Union Pacific Road the profile also shows that for nine hundred continuous miles, from Sidney westward, the road has an average height of over 5000 feet, and the lowest spot on that distance is more than 4000 feet above the sea; whereas, on the Northern route only about sixty miles, at most, are as high as 4000 feet; and the corresponding distance of nine hundred miles, extending from the mouth of the Yellowstone to the valley of Clarke's river, is, on an average, about 3000 lower than the Union Pacific line. Then, allowing that 1000 feet of elevation causes a decrease of temperature of three degrees, there is a substantial reason for the circumstance, now well authenticated, that the snows on the Northern route are much less troublesome than they are on the Union Pacific and Central Pacific route. At the same time it should not be claimed that there will be no trouble from snow on the Northern line. * * * * The impression I would wish to create is this: That a line can be so located between the valley of the Missouri and the mouth of the Columbia river, and to Puget Sound, that for the greater portion of the distance it will not encounter any serious trouble from snow; and that in the passage of the Belt range, between the Yellowstone and the upper Missouri, and the crossing of the Rocky mountains at Deer Lodge Pass, no greater obstacles from snow are likely to be met with than have already been encountered and overcome on roads in the New England States and in the State of New York. It is the general impression in the States, an impression entirely natural, that the farther we go to the north the deeper the snow; but on this line the modifying and controlling influences of the mild climate which pervades the Pacific slope and the interior along this latitude, combined with the greatly reduced elevation of the range of country to be occupied, and the low summits of the back-bone mountains to be passed, tend to confirm the favorable statements of intelligent gentlemen who have long been familiar with the regions in question.

The grades on the route across through the State of Minnesota and Territory of Dakota to the Missouri river will not be materially dissimilar to those on the other finished railroads south of it, passing from Chicago to Sioux City, Council Bluffs, etc., namely, undulating within the general limit of about forty feet per mile, although it may be deemed advisable, at a few points, for short distances, to run to a maximum of one foot per hundred, or fifty-three per mile. There is sufficient knowledge of this portion of the route to warrant this assumption. And beyond the Missouri, along the valley of the Yellowstone, to near the Bozeman pass, there is no known reason for assuming any higher limits. In passing Bozeman summit of the Belt range, and in going up the eastern side of the Rocky Mountains, it may be found advisable to adopt a somewhat higher gradient, for a few miles, in overcoming those summits.

The highest ground encountered between Lake Superior and the Missouri river, at the mouth of the Yellowstone, is only 2300 feet above the sea, the low summit of the Rocky Mountains is but little over 5000 feet, and the Bozeman pass, through the Belt range, is assumed to be about 500 feet lower. The height of the country upon which the line is traced, and upon which my estimate of cost is based, may be approximately stated thus, beginning at Lake Superior, going westward:—

	Miles.	Average height above the Sea.
To Dakota valley, ...	300	1200 feet.
Yellowstone river, ...	300	2200 "
Along Yellowstone, ...	400	2600 "
Flathead valley, ...	300	3500 "
Lewis or Snake river, ...	200	3000 "
Puget Sound, ...	500	400 "
Lake Superior to Puget Sound *via* Portland, . .	2000	
[Direct line, ...	1775]	

Compare this with the profiles of the finished line of the Union and Central Pacific Roads. Properly, the comparison should be made from Chicago—the eastern terminus on Lake Michigan, of the Omaha line. There are on that route, approximately, as follows:—

From Chicago.	Miles.	Average height above the Sea.
To Omaha, ...	500	1000 feet.
Near Cheyenne, ...	516	3300 "
Cooper's, ...	87	7300 "
Promontory Point, ...	482	6200 "
Humboldt, ...	406	4750 "
Reno, ...	130	4000 "
Auburn, ...	45	4400 "
Sacramento, ...	39	300 "
San Francisco, ...	135	50 "
Chicago to San Francisco, ...	2410	

On the Northern Pacific line there need be but two principal summits, whilst on the other there are four; the lowest of which is about a thousand feet higher than the highest on the northern route. If, therefore, the roads were the same length between the Pacific waters and the great lakes and navigable rivers east of the Rocky Mountains, the advantage would be largely in favor of the northern route; but this actual distance is 410 miles less, and the equated distance for ascents and descents in its favor will be very considerable in addition.

Mr. Roberts closes his very discriminating and guarded Report with these words—words which carry far more weight than would expressions of unstinted eulogy of the route examined:

> This special report contains, in brief, the substance of the information obtained during an exploration which occupied the entire months of June, July and August; involving in all over nine thousand miles of travelling, on railroads, in coaches, steamers, wagons, canoes, and on horseback; during which, owing to the remarkable facilities afforded through the aid of the modern conveyances by steam, both on land and water, our party was enabled to explore an extent of territory which in the time of Lewis and Clarke occupied nearly two years.
>
> In conclusion, I would state as the result of these explorations and investigations, after much reflection, and fully appreciating the responsibility devolved upon me as the Engineer selected by you for the duty, that the Northern Pacific Railroad route, with the land grant secured to the Company by the Government, possesses great intrinsic value, and will be, as a whole, a remarkably favorable line in all important respects; a line which, if judiciously located, honestly constructed, and properly administered, will pay within a few years a fair dividend on its cost. I had apprehensions that personal investigations might disclose material or possibly vital errors in some of the anticipations induced by former Reports. The result, however, has been in the other direction; and I am constrained by the facts to present an estimate of cost essentially lower than those previously submitted by the able Chief Engineer, and I offer it confidently as reasonable and reliable.

SOME DISCONNECTED FACTS.

—THE Northern Pacific Railroad has received from the United States Government a four-fold greater subsidy than was conferred upon the Union and Central Pacific Roads, since the land grant of the former is twice as large as those of the latter, and more than twice as valuable intrinsically per acre. The Government bonds loaned the Union and Central Roads are a debt, to be repaid, principal and interest; hence they are neither subsidy nor assets. If the Union and Central Pacific are solvent and successful with the bonus they actually received from Government, (and they certainly are so,) will the Northern Pacific prove solvent and successful with an equal business and with a bonus four times as valuable?

—The international character of the Northern Pacific Railroad will give it much strength and increased importance. It will be the natural and only thoroughfare and outlet for the population and products of the British Possessions west of Lake Superior, and will assuredly command the carrying trade of these provinces. The continuation of the Northern Pacific Road along the southern shore of Lake Superior to the Sault Ste. Marie, thence connecting with a new Canadian railway to Toronto, Montreal, and Portland, thus forming an international all-rail line from ocean to ocean, is among the probabilities of the early future. An important arm of the Northern Pacific Road is already under construction to the British border, at Pembina on the Red River. This will soon be met by a road built southward from Fort Garry, and thus will railroad facilities be carried to the very heart of these vast and fertile provinces, heretofore almost inaccessible. Farther west, other branch lines will be built northward into the British Possessions from the main trunk of the Northern Pacific Railroad, thus accommodating the entire area north of the forty-fifth parallel.

—In 1870, Eighteen Million pounds of freight entered Montana by way of Corinne station, Utah, being hauled in wagons 400 miles across a rugged country at a cost of *fifteen cents per pound.* This is some intimation of what a railroad will do for Montana, and Montana for a railroad.

—Two-thirds of the forty millions of people who now occupy the United States, are nearer by the Northern Pacific Railroad line to the mouth of the Columbia River and to Puget Sound than to any other part of the Pacific coast. The Northern Pacific will be the only transcontinental road under one control, offering to trade and travel a direct and uniform communication from ocean to ocean, free from interruptions and exactions arising from separate or hostile interests.

PUGET SOUND.

THE capacity and character of the harbors of Puget Sound, at the western terminus of the Northern Pacific Railroad, together with the climate and the agricultural, mineral, marine and timber resources of the North Pacific Coast, have obviously an important bearing on the future of the Road, and the country traversed by it. If the power of choice were given, it would be difficult to say what element could be added to the situation at the western end of the great thoroughfare, which would materially add to the advantages already given by nature.

Harbors.—Puget Sound itself is an inland sea, fringed with harbors of abundant, and sometimes superabundant, depth, and of sufficient capacity to shelter the commerce of two oceans. This system of land-locked bays is dotted with islands and joined to the Pacific by a gateway called the Strait of Fuca, eighty miles in length, ten to twelve in width, and from twenty to one hundred fathoms deep in all its parts. One arm of the Sound extends northward from where it joins the Strait, and the other southward; both divide and ramify, until the Sound, with all its bays and deep-water inlets, presents a shore-line of 1833 miles, and extends across two degrees of latitude. There is no obstruction at the entrance to this singular succession of harbors. The mouth of the Strait is easily entered in all weather—indeed, as a refuge for shipping, the waters of Puget Sound are simply unsurpassed. This mammoth haven is not only capacious beyond all possible commercial needs of the future, but it is safe in all its parts for the largest class of vessels. For one hundred and fifty miles the mid-channel is more than three hundred feet deep, and remarkably free from hidden dangers. On either side of the main channel, and in the various bays which will be the real harbors and shipping ports, the water is still deep, but not too deep for anchorage. The holding-ground is excellent. Commodore Wilkes, of the Navy, after exploring Puget Sound, said in his report:

> Nothing can exceed the beauty of these waters and their safety. Not a shoal exists within the Straits of San Juan de Fuca, Admiralty Inlet, Puget Sound, or Hood's Canal, that can in any way interrupt their navigation by a seventy-four gun ship. I venture nothing in saying that there is no country in the world possessing waters equal to these.

The basin containing the Sound and its branches is bounded on the east by the Cascade range of mountains, and sheltered on the west by the Olympian or Coast range. This depression between the two mountain ridges is about seventy-five miles in width, and that part which is not occupied by the waters of the Sound, is mainly covered with magnificent forests which extend to the very summit of the mountains. Here grows that Puget Sound timber of which so much has been written. These forests of giant fir and cedar are traversed by ten rivers, which flow down from the Cascade mountains and empty into the Sound, furnishing ten alluvial valleys of agricultural land, and supplying for logging purposes another thousand miles of inland shore line.

At this writing, it has not been decided which one of the many excellent harbors on Puget Sound shall be made the ocean terminus of the Northern Pacific Railroad and the site for the city which is to be the metropolis of the North Pacific coast.

Timber of Puget Sound.—The timber of Washington Territory has carried its own fame to all parts of the world. A gentleman who recently made the round-the-globe tour says that in examining a railway in India, he asked where the ties came from. The answer was, "Puget Sound." At Alexandria, in Egypt, while admiring some singularly perfect spars among the shipping, he asked where they grew, and was told, "Puget Sound." Afterward, in a seaport of China, he asked the source of certain timbers that a friend was using in the construction of wharves. The monotonous reply was, "Puget Sound."

Hon. S. Garfielde, Congressional Delegate from Washington Territory, speaking of the timber, says:

> Washington Territory, west of the Cascade Mountains, covers an area of about 20,000 square miles (exclusive of interior waters), three-fourths of which are timbered lands. The timber consists of fir, cedar, pine, spruce, hemlock, oak, maple, cottonwood, ash, dog-wood, alder, and some of the smaller varieties. The amount of the fir exceeds all the other varieties combined, and the cedar stands second in quantity. As the fir exceeds all other varieties in quantity, so also it does in utility, being valuable for ship-building, house-building, fencing, spars, and indeed almost every purpose for which wood is used. It is stronger than white oak.

Mr. Garfielde further says:

> The size of the fir trees, and the number growing upon given acres, in good timber districts, is almost incredible to residents upon the Atlantic slope of the conti-

nent. Trees often measure 320 feet in length, as I have several times demonstrated, more than two-thirds of which are free from limbs. Fifty, sixty, and sometimes as high as eighty good timber trees grow upon an acre of ground. In the summer of 1868, I had two parties out cruising for timber. The leaders of these parties were old and experienced lumbermen. One of these parties found a "berth" of timber, covering about 3,000 acres, which was so very fine that they took extra pains to ascertain the facts in regard to it in order to satisfy me of the truth of their report. They examined the forest carefully, and selecting an average tree, cut it down. That tree measured 42 inches in diameter at the stump, and at the first limb, 200 feet above, it measured 22 inches, the top or branching portion measuring 70 feet more. It was then ascertained by measurement and count that there was an average of 80 such trees to the acre throughout this berth. I do not give this statement as an illustration of the *size* of our trees, for these were by no means large ones. They were of the size, however, most convenient for milling purposes, and their great length, free from limbs, and their number per acre, make the average production very much more than is usually obtained. Our loggers work no " berth" of (fir) timber producing less than 30,000 feet per acre—from sixty to one hundred and twenty thousand feet being the more common yield. The Puget Sound lumber, which is now exported to the extent of about one hundred and eighty million feet annually, besides piles and spars, finds a market at San Francisco, Callao, Valparaiso, the Sandwich Islands, Australia, and China.

Of the lumber trade now existing, and to be developed along the western portions of the Northern Pacific Railroad, a high authority says:

Over hundreds and hundreds of square miles of area does this unequalled timber exist, astonishing for its size, perfection, and durability. For hundreds of miles lineally the Northern Pacific Railroad's main line and branch will run through it and near it. Nowhere else in the world does the material exist for such a trade in lumber outward by sea or inward by rail, as will be witnessed at the gateway of Puget Sound and on the western end of this Railroad. That trade seaward was enormous in 1869. Fourteen huge saw-mills on Puget Sound alone supplied it. Some of these mills cut 150,000 feet a day. They are run night and day. To one of them is attached, as its machinery of foreign transportation, 17 ships. It gives constant employment to 1000 men. It holds the fee-simple of over 100,000 acres of most carefully-selected timber land. The entire product of the mills of Puget Sound, in 1870, was over 190,000,000 feet.

Forests yielding 100,000 feet and upward are common all around Puget Sound. The wood of the firs and cedars, unequalled for lightness, straightness of cleavage, and resistance of moisture, stronger than oak, and more retentive of spikes and tree-nails, will supplant all other material for ship-building on both shores of the Pacific Ocean. Last year Puget Sound exported above one hundred and seventy million feet of lumber, twenty millions of lath and shingles, and an immense amount of masts, spars, and piles. This product of the as yet scarcely scarred forests of Washington Territory was sold in California, South America, Australia, Japan, China, the East Indies, and Europe. It furnished cargoes to 113 ships, 491 barks, 45 brigs, and 87 schooners.

Climate of Puget Sound.—The climate of Oregon and Washington Territory is a perpetual surprise to the tourist, and difficult to be understood by dwellers in the Atlantic States. Chief Engineer Roberts, from whose very candid report we elsewhere quote, says of Puget Sound winters:

> The climate of this favored region is very remarkable, and will always remain an attractive feature. Even in the coldest winters there is, practically, no obstruction to navigation from ice; vessels can enter and depart at all times; and the winters are so mild that summer flowers, which, in the latitude of Philadelphia on the Atlantic Coast, we are obliged to place in the hot-house, are left out in the open garden without being injured.

Official observations, covering a period of six years, show the average temperature on Puget Sound to be as follows: Winter, 40°; Spring, 48°; Summer, 62°; and Autumn, 51°; for the year, 51°. The difference in mean temperature, between summer and winter, it will be noticed, is only 22°.

The average rain-fall during the same period was 53 inches, distributed as follows: Spring, 11.19; Summer, 3.85; Autumn, 15.85; Winter, 22.62.

The seasons would more properly be classified as two, summer and winter, each running insensibly into the other, and each with its pleasant and its rainy weather. The grass is green nearly the whole year. A gentleman from that region (Mr. E. Meeker, of Olympia), brings us fifty-three varieties of flowers plucked by him in the open air, in latitude 47°, on the 4th of December, 1870. On the 10th of January, 1870, twenty-two varieties were still in bloom out of doors. Such is the climate at the western extremity of the Northern Pacific Railroad. The causes of this singular modification of temperature have been discussed in another portion of this pamphlet. They are, in brief, the warm south and west winds which there prevail in winter, added to the effect of the Japanese current, which does for our North Pacific coast what the Atlantic Gulf Stream does for the climate of Northern Europe.

Soil and Productions.—In connection with the remarkable climate the productive capacity of the soil of the Puget Sound region is great both as to quantity and quality. The quality and yield of wheat on the Pacific slope are well known to be good, and in this regard Puget Sound is no exception to the rule. All the other cereals are grown to perfection; oats are particularly plump and heavy. Indian corn has been ripened thirteen years in succession in one locality, and as many as forty bushels to the acre have been raised, but the yield of this is not so good here as in a region where the nights are warm and sultry. The small grains are at home in Washington Territory. Pork is usually fattened upon peas, wheat, and barley, and, it is claimed, can be made as cheaply as upon corn in the Western States.

Fruits of all kinds, except the peach and the grape, are raised in great profusion, and are remarkable for size and flavor. Although California fruit is justly in good reputation, Oregon and Washington apples are exported to San Francisco, where they bring an advanced price on account of their excellence. The potatoes and other vegetables grown on the north coast are also in high favor in the San Francisco market.

This is emphatically the dairyman's region. Pure, soft water abounds almost everywhere, grass grows early in spring and late in autumn, and the root crops produce immense returns. Western Washington will rival England in its turnip yield. With access to the world's markets, the dairy interest of this section will become a great and profitable branch of industry and of trade.

The Fish of Puget Sound.—The fisheries of Puget Sound, although yet in the infancy of their development, already constitute a leading interest. In the early future they are certain to assume an importance little dreamed of by those who are unfamiliar with the facts regarding them. The variety and abundance of fish of the highest excellence in Puget Sound and vicinity are as striking a characteristic of this region as are the timber and climate. The cod banks of Alaska are now known to be as extensive and productive as those of our Atlantic Coast. These fisheries are necessarily tributary to the trade of Puget Sound. The summer climate of Alaska is too moist for curing fish, while that of San Francisco is too hot and dry. The climate of Washington offers just the required medium. Besides, the fisheries are 800 miles nearer the drying racks and the shipping ports of Puget Sound than to those of San Francisco. These advantages will govern the location of the fishing trade.

The best whaling-ground now left to the American harpooners is within 18 days of the western terminus of the Northern Pacific Railroad. After the completion of this line, the headquarters of the American whaling interest will unquestionably be at Puget Sound; and, although that business is not so important now, as formerly, yet, with its attendant ship-building, outfitting, refitting, discharging, and the shipment of its product eastward by rail, it will contribute not a little to the business of Puget Sound and the Road.

Ship-Building.—There are no less than seven varieties of timber enumerated by the San Francisco board of underwriters as suitable for ship-building, which are to be found in abundance on Puget Sound. Pitch, rosin and turpentine of a superior quality have been produced in, and exported from, this locality. Coal and Iron are both at hand in abundance. The facilities for obtaining spars and ships' knees on the spot are perfect. All these advantages added to the extensive shore line of the Sound suitable for ship yards, the cheapness of labor, food and lumber, point to Puget Sound as the great ship-building centre of the Pacific Coast. This industry had already reached very considerable proportions before the present universal decline of American shipping interests began; and careful estimates made by practical ship-builders and confirmed by experience, show beyond question that vessels can be built and equipped considerably—probably 20 per cent.—cheaper on Puget Sound than anywhere else in the United States.

CHARTER AND MORTGAGE.

SYNOPSIS OF THE CHARTER.

The leading provisions of the Charter of the Northern Pacific Railroad, as amended to the present date (February, 1871), are as follows:

I. The Northern Pacific Railroad Company is authorized to construct, operate, and own a continuous Railroad and Telegraph line, "beginning at a point on Lake Superior, in the State of Minnesota or Wisconsin; thence westerly by the most eligible railway route, as shall be determined by the Company, within the territory of the United States, on a line north of the forty-fifth degree of latitude, to some point on Puget Sound," *via* the valley of the Columbia River, with a branch "from some convenient point on its main trunk line," across the Cascade Mountains to Puget Sound.

II. In aid of the work, the charter grants to the Company 20 alternate sections, or 12,800 acres, of public land, to each mile of finished track, through the States traversed, and 40 alternate sections, or 25,600 acres, per mile through the Territories. This grant of land applies to the chartered branch of the Northern Pacific Road as well as to the trunk line. The charter also grants right of way, 400 feet in width, for both main line and branch, through the public domain, and the privilege of taking, free of cost, from the Government lands adjacent to the Road, all necessary construction material. Iron and coal lands are expressly embraced within the terms of the grant.

III. As often as 25 consecutive miles of the Road are completed, "in a good, substantial, workmanlike manner," such finished portion is to be examined and approved by three Commissioners, appointed by the President, and thereupon patents are to be issued transferring and confirming to the Railroad Company the lands of the grant corresponding to, and conterminous with, such completed section. By the operation of the Charter and the General Mortgage, such Government patents vest a perfect title to the lands of the Grant in the Trustees of the Mortgage, who represent the holders of the bonds now being negotiated. The Road is to be in all regards first class; the rails are to be made from American iron and American ore; and the Company is prohibited from charging the United States higher rates for transportation than are charged to individuals.

IV. The Government is to cause to be surveyed the lands for forty miles in width on both sides of the line of the Road, as fast as this shall be rendered necessary by the construction of the track. On the Company's filing a map of its intended route through any State or Territory, the lands embraced in the Grant are to be withdrawn from market, and thereafter will not be liable to sale, entry, or pre-emption, *whether surveyed or unsurveyed;* and the alternate sections belonging to the Government cannot be sold at less than $2.50 per acre. The usual authority is given the Company to appropriate a right of way through private lands by compensating owners therefor.

V. The charter provides that at least 25 miles of that portion of the Road between Portland (Oregon) and Puget Sound shall be completed by January 1, 1872, and at least 40 miles each year thereafter until the entire Road, from Lake Superior to Puget Sound, shall be completed.

IV. The charter (as amended by Act of Congress approved May 31st, 1870) expressly authorizes and empowers the Northern Pacific Railroad Company to issue its bonds to aid in the construction and equipment of its Road, and to secure such bonds by mortgage on its property of all kinds and descriptions, real, personal, and mixed, including its franchise as a corporation. It is also provided that, as proof and notice of its legal execution and effectual delivery, said Mortgage shall be filed and recorded in the office of the Secretary of the Interior. [*Note.* The Mortgage has been thus filed and recorded.] The matter of the title to Indian lands, if any, embraced within the Grant, is to be adjusted by the Government in a manner satisfactory to the Indians; and in all stages of its progress, the policy of the Northern Pacific Railroad Corporation will be one of entire friendliness to the natives of the plains.

SYNOPSIS OF THE GENERAL MORTGAGE.

The General Mortgage authorized by the charter, and executed by the Northern Pacific Railroad Company for the security of the holders of its First Mortgage Bonds, is dated July 1, 1870. It is drawn with the utmost care, and every provision has been embraced in it which could add to the security of the bondholder.

I. It conveys to two trustees, Messrs. Jay Cooke and J. Edgar Thomson, all the property and rights of property of the Northern Pacific Railroad Company, including:

1. The Road-bed and track, as fast as constructed, of the trunk line and all authorized branches.

2. All rolling stock and other equipments; all engine-houses, machine-shops, depots, water stations, and other buildings.

3. The entire Land Grant of the Road, as fast as it accrues to the Company, embracing between Fifty and Sixty Million acres.

4. All rights, franchises, privileges, and other property now owned or hereafter to be acquired by the Northern Pacific Railroad Company.

II. The Mortgage provides that all the property named above, and all moneys arising from the sale of the same, shall be held by the Trustees as security, and pledged to the payment of the Company's First Mortgage Bonds, principal and interest, as they shall become due, and shall be promptly applied to that purpose by the Trustees, in case of any default by the Railroad Company.

III. The Railroad Company shall have the right at all times to contract for the sale of portions of the lands of the Grant, at prices to be approved by the Trustees (but at not less than $2.50 per acre); and THE PROCEEDS OF ALL SALES OF LANDS, WHETHER IN CASH, BONDS, OR OTHER SECURITIES, SHALL BE DEPOSITED WITH THE TRUSTEES, and upon the payment to the Trustees of the proceeds of such sale or sales, the Trustees shall and will make a full and clear deed to the purchaser of the lands thus paid for. Such deed from the Trustees releases the land thus sold from the operations of the General Mortgage. The First Mortgage Bonds of the Company are made receivable at par and accrued interest in payment for the Company's lands at their lowest cash price. By a subsequent arrangement between the Trustees and the Railroad Company, the bonds are made always receivable for lands at *ten per cent. premium,* or 1.10.

IV. The Trustees, who directly represent the bondholders, are required by the terms of the Mortgage to see that the proceeds of all sales of First Mortgage Bonds are *devoted to the construction and equipment of the Road* and that the *proceeds of land sales* are used in *purchasing and cancelling the bonds of the Company*, if they can be bought before maturity at not more than 10 per cent. premium; otherwise the Trustees are to invest the proceeds of land sales in United States Bonds or Real Estate Mortgages for the further security of Northern Pacific bondholders. At all times, until the entire bonded debt of the Railroad Company is paid off and cancelled, the Trustees are required to see that they have in their control, as security, at least 500 acres of average land to every $1000 of outstanding First Mortgage Bonds, besides the Railroad itself and all its equipments and franchises.

During the construction of the Road, the interest on the bonds secured by this Mortgage is to be paid from the earnings of the finished portions of the Road, and from the general fund of the Company. No portion of the proceeds of land sales is to be devoted to the payment of interest, unless the general treasury of the Company shall be first exhausted, in which case the Company shall, from the first net earnings of the Road, make good the amount thus taken from the land fund.

In case of the resignation or death of either of the Trustees, the surviving Trustee is empowered to appoint a successor; or, upon the request of the bondholders, the appointment may be made by the courts in the usual manner.

CLIMATE AND RESOURCES OF MONTANA.

By B. F. POTTS,

Governor of Montana Territory.

IN the middle of the continent, between the Great Lakes and the Pacific Ocean—in the heart of that New Northwest, the extent, character and resources of which the people are at last beginning to appreciate—embracing within its boundaries four parallels of latitude and no less than twelve degrees of longitude, lies the great Territory of Montana. The superficial area of this territory is extensive enough to make three States as large as New York, the Empire State of the East; and, as I have stated elsewhere, I believe it to be the richest region in agricultural and mineral resources on the American continent. There are at least fifty thousand square miles of tillable land within its limits; and this land, under a cheap and simple process of irrigation, is of unsurpassed fertility, yielding in the greatest abundance all varieties of the cereals. I have seen samples of wheat which yielded eighty bushels to the acre, and the average yield, even with the very imperfect methods of cultivation which are in vogue here, is from forty to sixty-five bushels. This exceeds the yield of the famous wheat-fields of Minnesota, and is about four times as great as the average wheat crop of Ohio. Rye, oats and barley produce enormously, and the yield of vegetables is simply without a parallel in the history of horticulture in America. The common yield of potatoes, for instance, is 400 bushels per acre.

Lands for grazing purposes, too, are of vast extent and of the best quality. Grasses as nutritious as sheaf-oats cover the hills and valleys and extend far up the mountain sides, affording pasturage for numberless herds of cattle and sheep during the entire year. The cattle alone now to be found in the Territory number at least sixty thousand head, and so abundant are these grasses, and so mild is our climate, that no grain or hay is fed to them at all—they take care of themselves and keep fat all winter. Our meat markets are supplied with beef taken from among the different herds at all seasons of the year, and it is found to be of the fattest and sweetest, making delicious food, superior generally in quality and flavor to the grain fed stock of the States. Certainly no country can surpass this for grazing purposes; and there is none where, in the future, when the Northern Pacific Railroad has reached us, such fortunes are to be made in the business of raising stock for the market.

Of the mineral wealth of Montana all the world has heard. Not less than twelve million dollars' worth of gold-dust was taken from the mines last season, and iron, copper, coal, and other minerals exist in exhaustless abundance.

I suppose, however, that the thing about our New Northwest which has most surprised the public is the genial character of its climate. Radically different as it may seem from the prevalent idea regarding it, it is nevertheless true that the climate of Montana, as a whole, is milder than that of New York, while the purity and dryness of the atmosphere make the variations of temperature far less noticeable. The old theory that the further north we go the more severe the climate becomes is now generally exploded. It is understood, at last, that isothermal divisions, except in their larger aspects, are entirely independent of degrees of latitude; and the various explorers and topographers who have been sent out here by the Government have shown by instrumental tests that the temperature of Walla Walla, on the 46th degree of latitude, is the same as that of Washington City, on the 38th; that of Clark's Fork, in Montana, on the 48th, the same as that of St. Joseph, Missouri, on the 41st; and that of the Bitter Root Valley, Missoula County, Montana, on the 46th, the same as that of Philadelphia, on the 41st.

The winters in this section are generally open and pleasant, as may be inferred from the fact of the cattle grazing without shelter all the winter. The valleys are hardly ever covered with snow, and it is rare that the roads are not dry and passable for ten months in the year. On the mountains, of course, as in mountainous regions usually, winter sometimes pinches hard, and snow falls to considerable depths; but even the mountains are not the least attractive features of the territory. The elevation of the mountains, valleys, and plains of Montana above the level of the sea is from 2,000 to 4,000 feet less than that of Wyoming and Utah. This fact alone goes far to explain the milder climate and vastly greater productiveness of Montana.

How this great wealth, agricultural and mineral, is to be utilized and made to contribute its due share to the nation's commercial prosperity is a question not less important to the people at large than to the inhabitants of Montana itself; and in considering it I am brought to that great enterprise, the Northern Pacific Railroad, now building and destined to traverse from east to west our entire territory. This road will drain our richest valleys, and furnish an outlet for the immense future surplus productions of the Territory. All that has heretofore been written about the superior land-grant of the Northern Pacific Railroad in Montana, scarcely gives an adequate conception of the extent and true value of the grant. The company will receive twenty-five thousand six hundred acres of our best agricultural and grazing land for every mile of road that is built—lands which not only possess all the advantages which I have mentioned, but are within easy reach of timber, and abound in fine building stone of almost every variety and inexhaustible in quantity. I have no doubt that these lands will not only cancel the entire cost of building the railroad, but will leave a surplus to the company.

The Northern Pacific Railroad is of immense importance to Montana. It will enable our stock raisers to compete on favorable terms with those of Illinois and other States in the markets of the Eastern cities. A new impetus will be given to all our industries. Our mines will be developed, new ones will be opened, and those that produced twelve million dollars in gold last season will far exceed that sum annually. Our population will rapidly increase; the sixty-two cities and towns we now have will be doubled in number and quadrupled in size; and the public land, now unoccupied, will be cultivated by actual settlers. Other prosperous States will spring up around us; and before we enter upon another decade this great Northwest, now lying broad and inviting before the settler, will be contributing its rightful share toward the wealth, commerce, and general prosperity of the nation.

The enterprise which is opening this New Northwest is truly a great national work, and well deserves the encouragement, co-operation and support alike of all who, as Americans, feel an interest in the country's progress, or who as capitalists desire a liberal return upon investment.

730-GOLD LOAN

OF THE

NORTHERN PACIFIC RAILROAD

RAPID PROGRESS OF THE WORK.

The building of the Northern Pacific Railroad (begun July last), is being pushed forward with great energy from both extremities of the line. Several thousand men are employed in Minnesota and on the Pacific coast. The grade is nearly completed 266 miles westward from Lake Superior; trains are running over 150 miles of finished road, and tracklaying is rapidly progressing toward the eastern border of Dakota. Including its purchase of the St. Paul and Pacific Road, the Northern Pacific Company now has 460 miles of completed road, and by September next this will be increased to at least 560.

A GOOD INVESTMENT. Jay Cooke & Co. are now selling, and unhesitatingly recommend, as a Profitable and perfectly Safe Investment, the First Mortgage Land Grand Gold Bonds of the Northern Pacific Railroad Company. They have 30 years to run, bear Seven and Three-tenths per cent. gold interest (more than 8 per cent. currency), and are secured by first and only mortgage on the ENTIRE ROAD AND EQUIPMENTS, and also, as fast as the road is completed, on

23,000 ACRES OF LAND to every mile of track, or 500 Acres for each $1,000 Bond. They are exempt from U. S. Tax; Principal and Interest are payable in Gold; Denominations: Coupons, $100 to $1,000; Registered, $100 to $10,000.

LANDS FOR BONDS. Northern Pacific 7-30's are at all times receivable at TEN PER CENT. ABOVE PAR, in exchange for the Company's lands, at their lowest cash price. This renders them practically INTEREST BEARING LAND WARRANTS.

SINKING FUND. The proceeds of all sales of Lands are required to be devoted to the repurchase and cancellation of the First Mortgage Bonds of the Company. The Land Grant of the Road exceeds Fifty Million Acres. This immense Sinking Fund will undoubtedly cancel the principal of the Company's bonded debt before it falls due. With their ample security and high rate of interest, there is no investment, accessible to the people, which is more PROFITABLE OR SAFE.

EXCHANGING U. S. FIVE-TWENTIES. The success of the New Government 5 per cent. Loan will compel the early surrender of United States 6 per cents. Many holders of Five-Twenties are now exchanging them for Northern Pacific Seven-Thirties, thus realizing a handsome profit, and greatly increasing their yearly income.

OTHER SECURITIES. All marketable Stocks and Bonds will be received at their highest current price in exchange for Northern Pacific Seven-Thirties. EXPRESS CHARGES on Money or Bonds received, and on Seven-Thirties sent in return, will be paid by the Financial Agents. Full information, maps, pamphlets, etc., can be obtained on application at any agency, or from the undersigned.

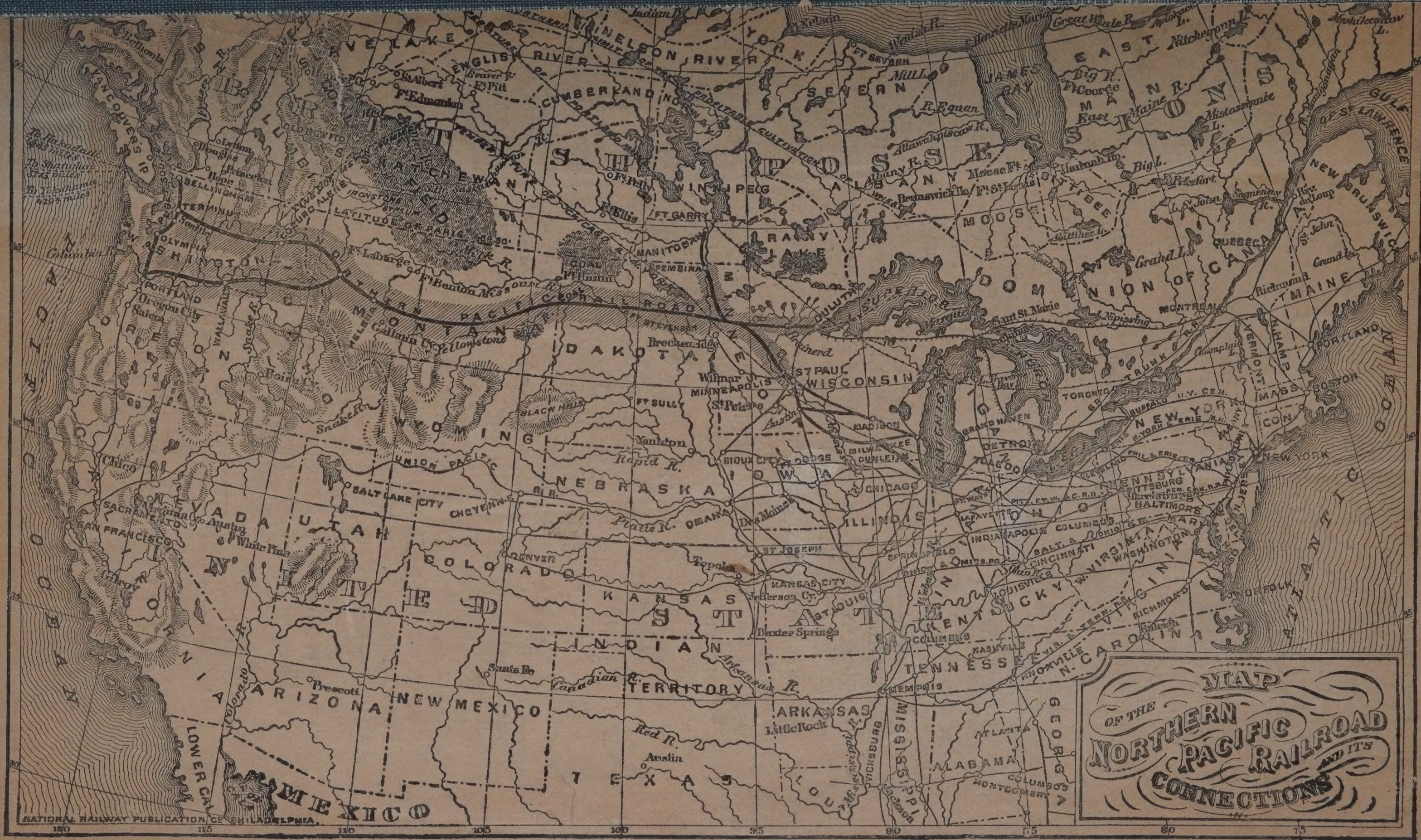
FOR SALE BY

JAY COOKE & CO.

Philadelphia, New York and Washington.

Financial Agents Northern Pacific Railroad Company.

By BANKS and BANKERS generally throughout the Country.


MAP
OF THE
NORTHERN
PACIFIC
RAILROAD
AND ITS
CONNECTIONS
NATIONAL RAILWAY PUBLICATION Co. PHILADELPHIA.
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF ST. LAWRENCE
DOMINION OF CANADA
UNITED STATES
MEXICO
LOWER CAL.
NORTHERN PACIFIC RAIL ROAD
UNION PACIFIC R.R.
WASHINGTON
OREGON
IDAHO
MONTANA
WYOMING
DAKOTA
MINNESOTA
WISCONSIN
NEBRASKA
IOWA
ILLINOIS
OHIO
INDIANA
KENTUCKY
TENNESSEE
CALIFORNIA
NEVADA
UTAH
COLORADO
KANSAS
INDIAN TERRITORY
ARIZONA
NEW MEXICO
TEXAS
ARKANSAS
MISSISSIPPI
ALABAMA
GEORGIA
N. CAROLINA
VIRGINIA
W. VIRGINIA
PENNSYLVANIA
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MAINE
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VERMONT
N. HAMP.
MASS.
CON.
N. JERSEY
MARYLAND
BRITISH COLUMBIA
SASKATCHEWAN
MANITOBA
KEEWATIN
ONTARIO
QUEBEC
EAST MAIN R.
SLAVE LAKE
ENGLISH RIVER
CUMBERLAND
NELSON RIVER
YORK
SEVERN
ALBANY
MOOSE
JAMES BAY
L. SUPERIOR
L. MICHIGAN
RAINY LAKE
WINNIPEG
VANCOUVER'S ID.
TERMINUS
OLYMPIA
PORTLAND
SALT LAKE CITY
CHEYENNE
SAN FRANCISCO
SACRAMENTO
DULUTH
ST. PAUL
MINNEAPOLIS
CHICAGO
ST. LOUIS
KANSAS CITY
OMAHA
DENVER
MEMPHIS
NEW YORK
BOSTON
MONTREAL
QUEBEC
TORONTO
DETROIT
CINCINNATI
BALTIMORE
WASHINGTON
RICHMOND
NORFOLK
PITTSBURG
BUFFALO
LATITUDE OF PARIS 48°50'
To Hakodadi 4432 miles
To Shanghai 5725 miles
To Yokohama 4293 miles
180
115
110
105
100
95
90
85
80
75
50
45
40
35
30

Lithomount
Pamphlet
Binders
Gaylord Bros. Inc.
Makers
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